

REGIONAL QUARTERS RENTAL SURVEY

COVERING

GOVERNMENT-FURNISHED QUARTERS

LOCATED IN

NORTH CENTRAL SURVEY REGION

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## I. SURVEY BACKGROUND

The Quarters Management and Information Systems (QMIS) Office coordinated a contractor-conducted field survey of the private rental housing market in the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio and Wisconsin from April 2000 through August 2000. This survey was undertaken as specified in the Office of Management and Budget (OMB) Circular No. A-45, and the U.S. Department of the Interior's Departmental Quarters Handbook. OMB Circular A-45 provides for reconfirmation of the market based rental rates at least once every five years, or sooner, if conditions warrant.

The collection and analysis of rental housing data were accomplished employing methods similar to those used in previous surveys. Automated and manual analytical procedures were used to establish base rental rates for houses (including plexes), apartments, mobile homes and trailer spaces. Rental rates for cabins were established based upon their comparability with 1-bedroom houses. Rental rates for temporary housing and travel trailers were established based upon their comparability with mobile homes. Rental rates for dormitories, bunkhouses and transient quarters were established by extending the principle of comparability, as provided for in OMB Circular A-45.

The objective of regional surveys, as set forth in OMB Circular No. A-45, is to develop reasonable rental rates based upon the "... typical rental rates for comparable private housing in the general area in which the Government quarters are located ...". The policy set forth in OMB Circular A-45 is as follows:

Rental rates and charges for Government quarters and related facilities will be based upon their "reasonable value...to the employee...in the circumstances under which the quarters and facilities are provided, occupied, or made available."...reasonable value to the employee or other occupant is determined by the rule of equivalence; namely, that charges for rent and related facilities should be set at levels equal to those prevailing for comparable private housing located in the same area, when practicable...

The regional survey method uses regression analysis techniques to establish a base rental rate for a given type of quarters that reflects the typical rate for that type of housing in the survey area. Regression analysis allows the QMIS Program Office to establish adjustments that reflect: (1) the contributory value (+ or -) of housing features that the private rental market indicates are significant; and (2) relevant social and economic factors that are manifested in the rent levels of individual communities.

Because regression analysis permits assessment of (and adjustment for) different locations, as measured by market rents, several localities or states can be surveyed at a time to minimize data collection costs and the rates can be individualized for communities significantly at variance with the regional rent pattern.

The resulting product (finalized rental rates), when derived from carefully applied automated statistical analysis, provides a logical and equitable base rental rate structure supported by the market rental rate pattern of the region and the community.

## II. INVENTORY OF GOVERNMENT-FURNISHED QUARTERS

This survey was initiated with an inventory of Government-furnished quarters (GFQ) managed by the agencies and bureaus that participate in the QMIS program.

Most agencies and bureaus are now using the QMIS database software to manage their inventories. This software was developed by the QMIS Program Office in Denver. The database software allows an installation or region to maintain its own housing inventory. Rents can be calculated in just minutes, even for hundreds of quarters. This decentralized system provides local control of the housing inventory. As always, the key to accurate rents is accurate, up-to-date inventory information. Software with the new housing rental rate formulas and new utility rates is distributed from Denver whenever new regional surveys are conducted or at CPI time. If you do not receive new CPI software by approximately January 1st of each year, please contact the QMIS Program Office (303-969-7240). It is important that all agencies and bureaus submit (on diskettes or via electronic mail) updates to their housing inventories at least once a year. This information is used to determine the communities and characteristics to be sampled in new Regional Surveys. The information is also used for various general management reports.

## III. CONTRACTING FOR THE PRIVATE RENTAL SURVEY

### A. DETERMINATION OF THE COMMUNITIES TO BE SURVEYED

Selection of the communities to be surveyed was initiated with a review of the nearest established communities identified in the quarters inventory process. Their geographic locations and populations were determined to enable selection of established communities nearest to concentrations of Government housing.

Inclusion of these communities enables a comparison of the community rental rate structure with that of the survey region. This permits a ready determination of whether the local or the regional rental rate structure should be utilized to establish the GFQ base rents. A complete discussion of this process is contained in section IV of this report.

The communities surveyed represented broad geographic and population ranges. The largest community surveyed, Chicago, Illinois had a 1990 population of 2,783,726. The smallest community, Frankfort, Michigan, had a population of 1,546. A list of the surveyed communities appears as Table 1. In accordance with OMB Circular A-45, communities with 1990 census populations below 1,500 were not analyzed.

TABLE 1 COMMUNITIES SURVEYED

<u>STATE AND COMMUNITY</u>	<u>1990 CENSUS POPULATION</u>
ILLINOIS	
Chicago, IL	2,783,726
Danville, IL	33,828
Harrisburg, IL	9,289
Havana, IL	3,610
Jonesboro, IL	1,728
Marion, IL	14,545
Murphysboro, IL	9,176
INDIANA	
Chesterton, IN	10,069
Dale, IN	1,553
Indianapolis, IN	731,327
Marion, IN	32,618
Seymour, IN	15,576
Terre Haute, IN	57,483
IOWA	
Des Moines, IA	193,187
Knoxville, IA	8,232
Missouri Valley, IA	2,888
West Branch, IA	1,908
MICHIGAN	
Battle Creek, MI	53,540
East Tawas, MI	2,887
Frankfort, MI	1,546
Fremont, MI	3,875
Gaylord, MI	3,256
Gladstone, MI	4,565
Grawling, MI	1,944
Houghton, MI	7,498
Iron River, MI	2,095
Ironwood, MI	6,849

TABLE 1 COMMUNITIES SURVEYED (Continued)

<u>STATE AND COMMUNITY</u>	<u>1990 CENSUS POPULATION</u>
MICHIGAN	
Manistee, MI	6,734
Manistique, MI	3,456
Milan, MI	4,040
Newberry, MI	1,873
Reed City, MI	2,379
Saginaw, MI	69,512
Traverse City, MI	15,155
MINNESOTA	
Aitkin, MN	1,698
Bemidji, MN	11,245
Detroit Lakes, MN	6,635
Duluth, MN	85,493
Ely, MN	3,968
Grand Rapids, MN	7,976
International Falls, MN	8,325
Litchfield, MN	6,041
Minneapolis, MN	368,383
Pipestone, MN	4,554
Roseau, MN	2,396
Sandstone, MN	2,057
Silver Bay, MN	1,894
Thief River Falls, MN	8,010
Virginia, MN	9,410
MISSOURI	
Bloomfield, MO	1,800
Brookfield, MO	4,888
Cassville, MO	2,371
Doniphan, MO	1,713
Fredricktown, MO	3,950

TABLE 1 COMMUNITIES SURVEYED (Continued)

<u>STATE AND COMMUNITY</u>	<u>1990 CENSUS POPULATION</u>
MISSOURI	
Joplin, MO	40,961
Mountain View, MO	2,036
Popular Bluff, MO	16,996
Salem, MO	4,486
Springfield, MO	140,494
Waynesville, MO	3,207
OHIO	
Akron, OH	223,019
Chillicothe, OH	21,923
Cincinnati, OH	364,040
Cleveland, OH	505,616
Coshocton, OH	12,193
Dayton, OH	182,044
Ironton, OH	12,751
Oak Harbor, OH	2,637
Port Clinton, OH	7,106
WISCONSIN	
Ashland, WI	8,695
Crandon, WI	1,958
Hayward, WI	1,897
Medford, WI	4,283
Milwaukee, WI	959,275
Osceola, WI	2,075
Park Falls, WI	3,104
Prairie du Chien, WI	5,659
Rhineland, WI	7,427
Spooner, WI	2,464
Tomah, WI	7,570
Viroqua, WI	3,922

## B. DETERMINATION OF THE HOUSING CLASSES TO BE SURVEYED

In order to determine which housing classes to survey, the inventory data for the agencies participating in the QMIS system were separated into housing classes shown in Table 2, below. Analysis of the data revealed the following numbers of units per housing class:

TABLE 2 GOVERNMENT-FURNISHED QUARTERS - (BY HOUSING CLASS)

Housing Class	# of Units	Avg. Age	Age Range	Avg. SQFT	SQFT Range
Houses					
4+ Bedrooms	42	60	(27 -108)	1,839	(1,200 - 3,326)
3 Bedrooms	243	43	(7 -119)	1,299	(768 - 2,512)
2 Bedrooms	73	55	(13 -159)	1,043	(600 - 1,961)
1 Bedroom	15	58	(10 -131)	902	(375 - 1,581)
Apartments					
3+ Bedrooms	1	35	(35 -35)	960	(960 - 960)
2 Bedrooms	22	55	(33 -132)	891	(750 - 1,348)
1 Bedroom	25	28	(20 -132)	704	(512 - 720)
Efficiency	2	41	(42 - 42)	393	(393 - 393)
Cabins	35	55	(8 -120)	561	(180 - 2,300)
Mobile Homes					
4+ Bedrooms	0	0	0	0	0
3 Bedrooms	5	22	(9 - 36)	913	(550 - 1,048)
2 Bedrooms	6	22	(11 - 28)	776	(600 - 980)
1 Bedroom	0	28	(28 - 29)	692	(672 - 720)
Travel Trailers	1				
Dormitories	30	53	(11 -123)	1,660	(539 - 5,850)
Trailer Pads	3				
TOTAL UNITS	503				

As with other regional surveys, the contractor was directed to survey only those housing classes for which a representative sample could be readily obtained in the private rental market. Thus, comparables were not obtained for cabins or lookouts, temporary housing, travel trailers, bunkhouses/dormitories, transient quarters or tents.

Rental rates for cabins were established by using the average rental rate for one-bedroom, single-family houses as the basis of comparison. Additional adjustments, that reflect the absence of certain standard housing features in some cabins, have been included for use when appropriate.

Since temporary housing and travel trailers (mobile home-like structures containing less than 256 square feet of gross living area) are most structurally similar to mobile homes, the rental charges for these housing classes are based upon the analysis of mobile home market rental comparables.

Since comparable bunkhouse or dormitory housing does not exist in most communities, the QMIS Program Office is unable to obtain sufficient market data to provide a satisfactory statistical base. Consequently, rental rates for bunkhouses and dormitories have been established using an extension of the Principle of Comparability, as permitted in OMB Circular A-45. Similarly, the rental charge for transient quarters has been established in conjunction with the dormitory rate structure.

OMB Circular A-45, revised October 20, 1993, excludes tents from the definition of Government-furnished quarters. Therefore, rental charges have not been established (and should not be assessed) for tents which are used as employee housing.

Four housing classes (houses/plexes, apartments, mobile homes and trailer spaces) were ultimately selected for field survey and computer analysis. The contractor was instructed to select comparables, built to Housing and Urban Development (HUD) minimum housing standards, wherever possible. The number of observations obtained for each housing class in each community surveyed varied depending upon the number of nearby Government quarters of that class. The inventory data for each of the housing classes was analyzed to determine frequencies and age and size ranges for major construction elements. The information in Table 2 was used to guide the contractor in the conduct of the survey.

### C. HEATING FUELS AND UTILITY CHARGE SURVEY

To ensure reliability of the energy consumption estimates for housing where consumption is neither metered nor measured, this report uses a series of contractor-developed heating and cooling consumption tables for each general type of housing represented in the survey. The tables are based upon energy consumption studies that use a methodology meeting housing industry standards. The results reflect energy consumption for variously sized single-family houses (with and without basements), apartments, and mobile homes. A complete discussion of the energy consumption/cost methodology is contained in Section VI.

## D. CONTRACTOR SELECTION

The National Business Center, Products & Services provided procurement support and project coordination for this Private Rental Survey. Reimbursement for survey expenses was underwritten by the agencies and bureaus that participate in the Quarters Management Program.

The private rental survey was completed by SCS, Inc., of Talala, Oklahoma, during the months of April 2000 through August 2000. A total of 1,240 private rental housing comparables were sampled. In addition, electrical, heating fuel, utility, appliance, and other related service charges were collected in each of the communities surveyed. The private rental housing costs that were obtained reflected current rental costs and required no adjustment for time.

## IV. REGIONAL SURVEY PRINCIPLES AND PROCEDURES

### A. SURVEY PRINCIPLES

The purpose of a regional survey is to determine and establish reasonable quarters rents, through an analysis of the market rents of comparable private housing in established communities nearest to concentrations of Government housing. The process of arriving at the base rent of a structure is influenced by real estate appraisal principles, statistical limitations, and administrative considerations. Often there may be a conflict among these three interests which necessitates a trade-off.

1. Real estate appraisal principles include matching comparables as closely as possible to the specific subject properties in physical characteristics and location, and adjusting in a logical direction for all significant differences.

2. Statistical principles involve: (a) trying to minimize the standard error of the estimate (unexplained variation); (b) getting a good match of characteristics between the properties analyzed and those the analysis is applied to; (c) obtaining a large and diverse sample; and (d) making adjustments for factors that are significant in explaining variation. Ideal samples may not always be available in the market; and the market search may be limited (like an appraisal) because of time and budget constraints.

3. Administrative considerations recognize that Government housing is usually not located in established communities, and that physical characteristics (such as in historical houses, one-room cabins, lookouts or dormitories) are difficult to match in the market. Government quarters are often found in areas influenced by tourism or boom/bust natural resource development that may produce unreasonable rents. Consistency and relative reasonableness, as well as time and budget constraints, must also be taken into consideration.

While trade-offs among these three considerations may result in a less than ideal application of any one of the three principles, the goal is still to produce "reasonable" Monthly Base Rental Rates (MBRR) for quarters that are relatively consistent with the local market rents for similar housing, internally consistent and logical from one unit to another, and represent reasonable value to the employee.

## B. MULTIPLE REGRESSION PROCEDURES USED IN RENTAL RATE COMPUTATIONS

There are several reasons for using the regional survey method to arrive at quarters rental rates. These include accuracy, consistency, fairness, cost effectiveness/economy, and the provision in OMB Circular A-45, that regional surveys are the preferred method.

Prior to the use of the regional survey method, quarters Monthly Base Rental Rates (MBRR's) were reset every five years by individually appraising each quarters unit. The appraisal process normally relied upon the use of a small number (2-4) of comparables for each subject Government quarters unit and made logical or market abstracted adjustments to each comparable. In many instances the same comparables were used to establish rental rates for several quarters. Thus the selection of comparables became critical. Individualized appraisals often led to inconsistencies among units in the same area. Many times different agencies, managing similar or identical housing units in the same area, had substantially different rents after analyzing the same rental market. Appraisers valuing several different units using separate sets of comparables and adjustments can also sometimes arrive at rents not logically related to one another. Finally, the appraisal process required a considerable amount of travel, and individualized writing, typing and editing of appraisal reports, which was expensive and very time consuming.

Alternatively, the regional survey method relies upon much larger samples of comparables. These are analyzed, statistically, to objectively determine those factors that are significant in explaining variations in the adjusted rent of each class of comparables. Each class of comparables (houses, apartments and mobile homes) is analyzed separately to determine which locations and physical characteristics are important in explaining the differences in rents among individual rental units and communities. The computer program independently and objectively determines the best set of characteristics (formula) to explain the rental pattern. This formula varies for each survey region and housing class.

The rental rates are based upon an analysis of regional data and local data. The rents in all surveyed communities for each housing class are tested for statistical significance. All significant negative location adjustments are applied to the quarters using that community as their nearest established community. **Positive location (community) adjustments are not applied; so Government housing units near high-rent communities are charged the typical rent for the region as a whole, rather than the typical rent for that high cost location.**

The statistical process used is called forward in-and-out, step-wise multiple regression analysis. It takes all of the variables considered and forms a matrix or grid showing how every variable is related to every other variable (cross-correlation matrix). In this phase of the analysis, significant inventory items relating to the dwelling structure are coded into the computer as variables to be tested for their impact, if any, on rent. The variable to be explained (in this case rent) is called the dependent variable, because its value is determined by that of the other (independent) variables.

In forward in-and-out step-wise multiple regression analysis, the independent variable that explains the most variation in the dependent variable (rent) is selected first by the computer and entered as Step 1. The remaining variation is then recomputed, and the independent variable that explains the largest portion of the remaining variation is selected by the computer and entered as Step 2. As each new variable is added, the coefficients of all the previously entered variables are recomputed to take into account relationships

among the independent variables. If a previously entered variable no longer meets the test of significance, it is removed.

As this procedure uses the variation squared, it is highly sensitive to cases with extreme variations from the norm. Since the purpose of a regional survey is to find the typical rent for housing with certain characteristics, it is useful (and mandatory) to cull comparables with unusually high or low rents that are apparently unrelated to their characteristics. Such non-conforming rentals tend to obscure the typical pattern. To accomplish this culling, the following steps are normally taken.

**Step 1.** A listing of all the comparables is checked to see that the program has proper decodes, that no rental has been entered twice, and that the data is complete for each variable to be tested. The range for each rent class is also checked.

**Step 2.** Regression Run 1 (square foot base formula): The purified data base is analyzed for the best fit of adjusted rent versus square feet and the logarithm of square feet. This comparison is undertaken because square footage in buildings is generally the variable that explains the most variation of adjusted rent. It is also a universal variable (one that applies to all cases) and a continuous variable (one that changes in many small increments).

**Step 3.** A listing is produced which shows by community the rent/predicted rent ratio of each private rental sample. The predicted rent is one computed using the square foot base formula derived in step 2. The purpose of this listing is to screen out individual rentals whose ratios are far out of line relative to other rental comparables in the same community.

**Step 4.** A scattergram of rentals for each class, showing adjusted rent by square feet, is produced to visually display the data. These scattergrams, and the listings produced in Step 3, above, are used to remove samples with unusually high or low rents in each size grouping. A separate variable for each of the remaining communities is then entered into the next step, the full regression analysis, to see if it has a statistically significant location adjustment after other adjustments have been made. This run and a crosstab run of physical features allows for selection of other variables that are significantly represented and widely (geographically) distributed. These variables are turned into dummy (yes/no) and combination variables. Continuous and discrete variables are entered as simple variables, logarithmic transformations, and in logical combinations.

**Step 5. (First Full Regression Run).** The screened samples for each housing class to be analyzed, along with the variables to be tested, are analyzed to find coefficients for the significant variables ones. The results are checked for logic and cross-correlation; normally only one form of a variable is allowed to stay in the equation. Variables with illogical results are checked to find reasons for such deviation from expected results. Such variables are normally dropped from subsequent regression runs. Sometimes the samples containing such variables are culled; however, that action (culling samples) is uncommon.

**Step 6. (Other Full Regression Runs).** The full regression analysis is rerun without the illogical variables and/or dropped cases. If the end results look reasonable, the coefficients determined by regression analysis are used to compute Monthly Base Rental Rates (MBRR's) for individual Government-furnished quarters.

**Step 7. (Predicted Rent Tables).** The coefficients of each satisfactory regression run are put into a computer program which produces a table of predicted quarters MBRR's. The base values and all possible combinations of adjustments are reviewed to ensure the results are reliable for the full range of values. If not, the cause of the problem is diagnosed and corrected, and the regression analysis is rerun, producing a revised set of coefficients. Then Step 6 is repeated, and a new set of rent tables is produced.

## V. ESTABLISHMENT OF MONTHLY BASE RENTAL RATES (MBRR)

### A. USE OF BASE RENT CHARTS

Although rental computations have been automated, producing Monthly Base Rental Rates (MBRR's) and final Net Rents for most quarters, housing managers should understand the methodology used in determining the rental rates. Therefore, a set of charts has been prepared to allow the manual computation of the MBRR's for each class of rental housing. The charts have been constructed as size/age tables for the three major categories of housing (houses, apartments and mobile homes). By knowing the gross square feet of the livable area (size), the age, and the housing class of a building being used as quarters, one can determine the base rent from the proper table. The charts also contain columns and/or footnotes of rent adjustments which modify the rent from the size/age table to produce a MBRR for an individual quarters unit. **The value of one refrigerator and one stove is included in the rents listed in Tables 3a-d, 4a-d and 5a.** Therefore, if the Government does not provide a refrigerator or a range in the quarters, the value of each non-provided appliance should be subtracted from the monthly rent. The current values of a refrigerator and range are shown in Table 18 of this report, and may be adjusted annually by the QMIS Program Office to reflect changes in the Consumer Price Index (CPI) which may occur following the issuance of this report. In selecting the appropriate rent table, it is important to remember that the **design of the quarters, not its use, determines its category.** Thus, a house or an apartment unit **designed** to be occupied by an individual or a family, but which is actually used to house unrelated individuals, would be valued by the category for which it was designed to be used, rather than as a bunkhouse/dormitory. Where, however, a structure is not designed for occupancy by an individual, or family, or has been substantially modified to house individuals on a dormitory basis, it would be appropriate to apply bunkhouse/dormitory rates. Thus, an unmodified three-bedroom house with a **planned occupancy** of six unrelated individuals (normally two persons per bedroom) would have a rental rate determined by calculating the rental rate for a three-bedroom house and then dividing that rate by six. This rate would change if the number of **planned** occupants changed. If the house were later **structurally modified** to be used as a bunkhouse/dormitory, the rate then would be the dormitory rate.

Based upon information provided by the contractor, deductions from the monthly contract rental rate of each rental sample were made for the contributory costs of utilities, appliances, furnishings and services, provided and included in the contract rent. No deductions were made for central air conditioners, refrigerators or ranges; however, if a refrigerator or range was missing, the value was added to the adjusted rent. Central air conditioners are valued at their contributory value, if any. The resulting adjusted monthly contract rental rate represents the contributory value of the dwelling structure equipped with a refrigerator and a range.

The establishment of final monthly quarters rental charges for houses, apartments, mobile homes and cabins/lookouts requires the addition of charges for Government-provided utilities, services, appliances and furnishings. Conversely, **deductions** are required for the values of ranges and refrigerators when they are not provided by the Government.

There are a total of nine rental rate charts: four charts for single-family housing, four charts for apartments, and one chart for mobile homes. Instructions for computing rental rates for cabins, bunkhouses and dormitories, transient quarters and trailer spaces are found in Sections V.E, V.F, V.G and V.H, respectively. Because OMB Circular A-45 excludes tents from the definition of "rental quarters," there is no charge for the provision of tents.

The use of the charts is fairly simple. First, find the chart for the category into which the GFQ fits. Next, round the square feet **down** to the nearest hundreds of square feet. Thus, if a unit has 980 square feet, the row labeled 900 SQFT would be used. Then the age should be rounded **up** to the nearest age increment. If the dwelling at issue was built in 1978, its age would be computed as 2000 (the current year) minus 1978 (the year built). Thus, in this instance, the unit is  $2000 - 1978 = 22$  years old; and the column headed by "25 YEARS OLD" should then be followed down to the 900 SQFT row to obtain the size/age adjusted rent.

The rent charts also have various location adjustments, as well as adjustments for physical features such as the number of bathrooms, the type of garage facilities, the condition of the housing, etc. These should be subtracted from, or added to, the size/age adjusted rent, as specified, to determine the MBRR.

When computing the final biweekly rent (net rent) to be paid, the MBRR must be adjusted to include the value of Government-provided related facilities (utilities, appliances, furnishings and services); and the administrative adjustments prescribed in OMB Circular A-45. Use Form DI 1880, Rent Computation Schedule, or similar form as may be used by agencies other than DOI.

Where a dwelling is larger than the highest square footage in the chart pertinent to that unit, use the size/age rent and adjustments of the bottom (largest SQFT) row. This may eliminate the need for some administrative adjustments due to excess size of the housing. If a dwelling is smaller than the smallest square footage, use the lowest square footage listed on the chart.

**The rent for a dwelling with more than 4 bedrooms (3 bedrooms for apartments and mobile homes) is calculated as if the unit had 4 bedrooms (3 bedrooms for apartments and mobile homes). In addition, the carport charge is the same regardless of the size of the carport; the maximum garage charge is the amount for a 2-car garage; and the fireplace charge is the same for one or more fireplaces. For rental calculation purposes a "cap" of 3 bathrooms applies. Therefore, assume 3 bathrooms when applying the bathrooms charge in the rent charts shown in tables 3a-d, 4a-d and 5a.**

To assist in the calculation of quarters MBRR's, examples are provided in the following pages. While the rates appearing in the following tables should allow you to establish MBRR's for essentially all of your properties, we recognize that we might not have anticipated all situations and conditions. Therefore, housing managers should use professional discretion to set rates for truly unusual situations. In cases where you must use some other method to establish rates, please notify the National Business Center, Products &

Services, Quarters Operations Office (Code D-2910), 7301 West Mansfield Avenue, Lakewood, CO 80235-2230; telephone **303-969-7240**; fax 303-969-7173. You should explain the conditions, the rate used, and your reasoning so that we may anticipate such circumstances in the future. You should retain the documentation for such actions in your files.

## B. SINGLE FAMILY HOUSING

For single family detached houses, including plexed dwellings and townhouses, use the rental chart which appropriately describes the housing class and the number of bedrooms of the subject quarters. The charts for houses are in tables 3a through 3d.

Assume for example, a 3-bedroom, 1 1/2-bath house, that was built in 1971 and which has a 2 car garage, two fireplaces, a central refrigerated air conditioning system and 1,290 gross square feet of living space. The house, located near Newberry, MI is fair in both exterior and interior condition.

First, the chart for 3-bedroom, good condition, 1 bathroom, houses (Table 3b) should be located and used. These charts are baseline charts, which assume that each house is in good condition inside and outside and has one full bathroom. Therefore, if the house is in good condition inside and outside and has one bathroom, no additional computations are needed. If there is a deviation from either good inside or outside condition or there are less or more bathrooms than one, then the computations must be changed as discussed below. In the first step, Table 3b is selected as the proper chart for 3-bedroom houses.

Next, the size (gross finished floor space) should be rounded **down** to the nearest 100 square feet (from 1,290 to 1,200 sqft). Under the column headed "**SQFT**," the figure 1,200 should be located. Further adjustments will be taken from this row.

Finally, the appropriate age column should be selected. The house in this example is  $2000 - 1971 = 29$  years old. The age should be rounded **up** to the next highest age column, which, in this case, is the column headed "**35 YRS OLD**." Follow this column down to the 1,200 square feet row to obtain the size/age "table rent" of \$468.

The first adjustment is the extra bathroom charge. Follow the column headed "**PER EXTRA BATHROOM**" down to the 1,200 SQFT row to find a charge of \$54 for a full extra bathroom. As the house in this example has only 1/2 of an extra bathroom, the adjustment is  $\$54 \times .5$  (1/2 extra bathroom) = \$27.00. Add \$27 to the rent.

The second and third adjustments are made for a fair exterior and a fair interior condition. Follow the column headed "**FAIR EXTERIOR/INTERIOR\***" down to the 1,200 SQFT row. The amount reflects a deduction of \$24 for a house with a fair exterior **and** a deduction of \$24 for a house with a fair interior. Since both the exterior and interior are in fair condition, the total adjustment is \$-48.

The fourth adjustment is for the central refrigerated air conditioning system. Follow the column headed "A/C (REF)" down to the 1,200 SQFT row. The amount reflects an addition of \$49 for central refrigerated air conditioning.

The fifth adjustment is for a two-car garage. Follow the column headed "**GARAGE (PER CAR)**" down to the 1,200 SQFT row. \$39 should be charged for each car the garage is designed to accommodate. Since the house in this example has a 2-car garage, multiply the amount shown for one car (\$39) times 2 to reflect the value of a 2-car garage ( $2 \times \$39 = \$78$ ). Add \$78 to the rent.

The sixth adjustment is made for the fireplace. Follow the column headed "**FIREPLACES**" down to the 1,200 SQFT row. The amount reflects an addition of \$47 for one or more fireplaces. Add \$47 to the rent for the fireplace.

The final adjustment is the community adjustment. The house in this example is located near Newberry, MI. The notes beneath the table (see "**COMMUNITY ADJUSTMENTS**") reflect that Newberry, MI receives an adjustment of -\$117. As instructed, subtract \$117 from the rent. Community adjustments are given only to communities in which the market rents are **lower** than the regional average level of rents. Communities not listed in the tables have rents which are equal to or higher than the regional average rent and do not receive community adjustments.

The last step is to round the resulting MBRR to the nearest whole dollar. If rounding is to be exercised, amounts equal to \$.50 or more should be rounded **up** to the next highest dollar; amounts equal to \$.49 or less should be rounded **down** to the next lowest dollar. The decision to round is discretionary.

In summary, the adjustments that produce the Monthly Base Rental Rate for the house used in this example are shown below.

Table Rent (1,200 SQFT/35 yrs. old) .....	\$468.00
Extra Bath Adjustment (.5 X \$54) .....	+ 27.00
Fair Exterior Condition Adjustment .....	- 24.00
Fair Interior Condition Adjustment .....	- 24.00
Central Refrigerated Air Conditioning Adjustment .....	+49.00
Garage Adjustment (Per Car X \$39) .....	+ 78.00
Fireplace Adjustment .....	+ 47.00
Community Adjustment (Newberry, MI) .....	<u>-117.00</u>
Monthly Base Rent .....	\$504.00

Monthly Base Rental Rate (Rounded) ..... \$504.00

TABLE 3a MONTHLY BASE RENT - GOOD CONDITION 4 BDR, 1 BATH, HOUSES

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 4 BEDROOM, 1 BATHROOM HOUSES

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER -IOR/ INTER -IOR*	FAIR EXTER -IOR/ INTER -IOR*	POOR EXTER -IOR/ INTER -IOR*	A/C (REF)	GAR- AGE PER (CAR)	FIRE- PLACES	PLEX
700	\$540	\$532	\$523	\$515	\$507	\$498	\$482	\$+54	\$+28	\$-14	\$-22	\$+49	\$+39	\$+47	\$-21
800	\$544	\$536	\$527	\$519	\$511	\$502	\$486	\$+54	\$+32	\$-16	\$-24	\$+49	\$+39	\$+47	\$-24
900	\$548	\$540	\$531	\$523	\$515	\$506	\$490	\$+54	\$+36	\$-18	\$-27	\$+49	\$+39	\$+47	\$-27
1000	\$552	\$544	\$535	\$527	\$519	\$510	\$494	\$+54	\$+40	\$-20	\$-29	\$+49	\$+39	\$+47	\$-30
1100	\$556	\$548	\$539	\$531	\$523	\$514	\$498	\$+54	\$+44	\$-22	\$-31	\$+49	\$+39	\$+47	\$-33
1200	\$560	\$552	\$543	\$535	\$527	\$518	\$502	\$+54	\$+48	\$-24	\$-34	\$+49	\$+39	\$+47	\$-36
1300	\$564	\$556	\$547	\$539	\$531	\$522	\$506	\$+54	\$+52	\$-26	\$-36	\$+49	\$+39	\$+47	\$-39
1400	\$568	\$560	\$551	\$543	\$535	\$526	\$510	\$+54	\$+56	\$-28	\$-39	\$+49	\$+39	\$+47	\$-42
1500	\$572	\$564	\$555	\$547	\$539	\$530	\$514	\$+54	\$+60	\$-30	\$-41	\$+49	\$+39	\$+47	\$-45
1600	\$576	\$568	\$559	\$551	\$543	\$534	\$518	\$+54	\$+64	\$-32	\$-43	\$+49	\$+39	\$+47	\$-48
1700	\$580	\$572	\$563	\$555	\$547	\$538	\$522	\$+54	\$+68	\$-34	\$-46	\$+49	\$+39	\$+47	\$-51
1800	\$584	\$576	\$567	\$559	\$551	\$542	\$526	\$+54	\$+72	\$-36	\$-48	\$+49	\$+39	\$+47	\$-54
1900	\$588	\$580	\$571	\$563	\$555	\$546	\$530	\$+54	\$+76	\$-38	\$-51	\$+49	\$+39	\$+47	\$-57
2000	\$592	\$584	\$575	\$567	\$559	\$550	\$534	\$+54	\$+80	\$-40	\$-53	\$+49	\$+39	\$+47	\$-60
2100	\$596	\$588	\$579	\$571	\$563	\$554	\$538	\$+54	\$+84	\$-42	\$-55	\$+49	\$+39	\$+47	\$-63
2200	\$600	\$592	\$583	\$575	\$567	\$558	\$542	\$+54	\$+88	\$-44	\$-58	\$+49	\$+39	\$+47	\$-66
2300	\$604	\$596	\$587	\$579	\$571	\$562	\$546	\$+54	\$+92	\$-46	\$-60	\$+49	\$+39	\$+47	\$-69

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CENTRAL EVAPORATIVE AIR CONDITIONING      ADD    \$25                      CARPORT                                      ADD            \$24

FINISHED BASEMENT.....SUBTRACT \$43 MULTIPLIED BY THE FINISHED SQUARE FEET IN THE BASEMENT  
DIVIDED BY THE TOTAL FINISHED SQUARE FEET IN THE UNIT, IE: FINISHED  
BASEMENT SQFT = 500; TOTAL FINISHED SQFT = 1276;  
ADJUSTMENT = \$43 x (500 / 1276) = \$43 x .3918 = \$16.85.

COMMUNITY ADJUSTMENTS:

DANVILLE, IL.	-\$124;	HARRISBURG, IL.	-\$180;	HAVANA, IL.	-\$108;	JONESBORO, IL.	-\$149;
MARION, IL.	-\$51;	MURPHYSBORO, IL.	-\$97;	DALE, IN	-\$11;	GLADSTONE, MI	-\$26;
HOUGHTON, MI.	-\$26;	IRON MOUNTAIN, MI.	-\$168;	IRON RIVER, MI.	-\$168;	IRONWOOD, MI.	-\$122;
MANISTIQUE, MI.	-\$30;	MUNISING, MI.	-\$26;	NEWBERRY, MI.	-\$117;	ONTONAGON, MI.	-\$122;
REED CITY, MI.	-\$35;	ST. IGNACE, MI.	-\$117;	AURORA, MN.	-\$91;	DETROIT LAKES, MN.	-\$70;
ELY, MN.	-\$61;	GRAND RAPIDS, MN.	-\$55;	INTERNATNL FALLS, MN.	-\$98;	LITCHFIELD, MN.	-\$43;
PARK RAPIDS, MN.	-\$70;	PIPESTONE, MN.	-\$147;	ROSEAU, MN.	-\$60;	SANDSTONE, MN.	-\$64;
SILVER BAY, MN.	-\$151;	THIEF RIVER FALLS, MN.	-\$131;	VIRGINIA, MN.	-\$60;	BLOOMFIELD, MO.	-\$142;
BROOKFIEDLD, MO.	-\$181;	CASSVILLE, MO.	-\$78;	DONIPHAN, MO.	-\$138;	FREDRICKTOWN, MO.	-\$135;
MOUNTAIN VIEW, MO.	-\$138;	POPULAR BLUFF, MO.	-\$142;	POTOSI, MO.	-\$135;	ROLLA, MO.	-\$143;
SALEM, MO.	-\$143;	SPRINGFIELD, MO.	-\$28;	VAN BUREN, MO.	-\$138;	WAYNESVILLE, MO.	-\$14;
COSHOCTON, OH.	-\$43;	ASHLAND, WI.	-\$38;	CRANDDON, WI.	-\$57;	HAYWARD, WI.	-\$79;
MEDFORD, WI.	-\$132;	PARK FALLS, WI.	-\$86;	PRAIRIE DU CHIEN, WI.	-\$12;	SPOONER, WI.	-\$91;
VIROQUA, WI.	-\$42;	WASHBURN, WI.	-\$143;				

\* - IF BOTH THE INTERIOR AND EXTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 3b MONTHLY BASE RENT - GOOD CONDITION 3 BDR, 1 BATH, HOUSES

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 3 BEDROOM, 1 BATHROOM HOUSES

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER -IOR/ INTER -IOR*	FAIR EXTER -IOR/ INTER -IOR*	POOR EXTER -IOR/ INTER -IOR*	A/C (REF)	GAR- AGE PER (CAR)	FIRE- PLACES	PLEX
500	\$465	\$457	\$448	\$440	\$432	\$423	\$407	\$+54	\$+20	\$-10	\$-17	\$+49	\$+39	\$+47	\$-15
600	\$469	\$461	\$452	\$444	\$436	\$427	\$411	\$+54	\$+24	\$-12	\$-19	\$+49	\$+39	\$+47	\$-18
700	\$473	\$465	\$456	\$448	\$440	\$431	\$415	\$+54	\$+28	\$-14	\$-22	\$+49	\$+39	\$+47	\$-21
800	\$477	\$469	\$460	\$452	\$444	\$435	\$419	\$+54	\$+32	\$-16	\$-24	\$+49	\$+39	\$+47	\$-24
900	\$481	\$473	\$464	\$456	\$448	\$439	\$423	\$+54	\$+36	\$-18	\$-27	\$+49	\$+39	\$+47	\$-27
1000	\$485	\$477	\$468	\$460	\$452	\$443	\$427	\$+54	\$+40	\$-20	\$-29	\$+49	\$+39	\$+47	\$-30
1100	\$489	\$481	\$472	\$464	\$456	\$447	\$431	\$+54	\$+44	\$-22	\$-31	\$+49	\$+39	\$+47	\$-33
1200	\$493	\$485	\$476	\$468	\$460	\$451	\$435	\$+54	\$+48	\$-24	\$-34	\$+49	\$+39	\$+47	\$-36
1300	\$497	\$489	\$480	\$472	\$464	\$455	\$439	\$+54	\$+52	\$-26	\$-36	\$+49	\$+39	\$+47	\$-39
1400	\$501	\$493	\$484	\$476	\$468	\$459	\$443	\$+54	\$+56	\$-28	\$-39	\$+49	\$+39	\$+47	\$-42
1500	\$505	\$497	\$488	\$480	\$472	\$463	\$447	\$+54	\$+60	\$-30	\$-41	\$+49	\$+39	\$+47	\$-45
1600	\$509	\$501	\$492	\$484	\$476	\$467	\$451	\$+54	\$+64	\$-32	\$-43	\$+49	\$+39	\$+47	\$-48
1700	\$513	\$505	\$496	\$488	\$480	\$471	\$455	\$+54	\$+68	\$-34	\$-46	\$+49	\$+39	\$+47	\$-51
1800	\$517	\$509	\$500	\$492	\$484	\$475	\$459	\$+54	\$+72	\$-36	\$-48	\$+49	\$+39	\$+47	\$-54
1900	\$521	\$513	\$504	\$496	\$488	\$479	\$463	\$+54	\$+76	\$-38	\$-51	\$+49	\$+39	\$+47	\$-57
2000	\$525	\$517	\$508	\$500	\$492	\$483	\$467	\$+54	\$+80	\$-40	\$-53	\$+49	\$+39	\$+47	\$-60
2100	\$529	\$521	\$512	\$504	\$496	\$487	\$471	\$+54	\$+84	\$-42	\$-55	\$+49	\$+39	\$+47	\$-63

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CENTRAL EVAPORATIVE AIR CONDITIONING      ADD    \$25                      CARPORT                                      ADD            \$24

FINISHED BASEMENT.....SUBTRACT \$43 MULTIPLIED BY THE FINISHED SQUARE FEET IN THE BASEMENT  
DIVIDED BY THE TOTAL FINISHED SQUARE FEET IN THE UNIT, IE: FINISHED  
BASEMENT SQFT = 500; TOTAL FINISHED SQFT = 1276;  
ADJUSTMENT = \$43 x (500 / 1276) = \$43 x .3918 = \$16.85.

COMMUNITY ADJUSTMENTS:

DANVILLE, IL.	-\$124;	HARRISBURG, IL.	-\$180;	HAVANA, IL.	-\$108;	JONESBORO, IL.	-\$149;
MARION, IL.	-\$51;	MURPHYSBORO, IL.	-\$97;	DALE, IN	-\$11;	GLADSTONE, MI	-\$26;
HOUGHTON, MI.	-\$26;	IRON MOUNTAIN, MI.	-\$168;	IRON RIVER, MI.	-\$168;	IRONWOOD, MI.	-\$122;
MANISTIQUE, MI.	-\$30;	MUNISING, MI.	-\$26;	NEWBERRY, MI.	-\$117;	ONTONAGON, MI.	-\$122;
REED CITY, MI.	-\$35;	ST. IGNACE, MI.	-\$117;	AURORA, MN.	-\$91;	DETROIT LAKES, MN.	-\$70;
ELY, MN.	-\$61;	GRAND RAPIDS, MN.	-\$55;	INTERNATNL FALLS, MN.	-\$98;	LITCHFIELD, MN.	-\$43;
PARK RAPIDS, MN.	-\$70;	PIPESTONE, MN.	-\$147;	ROSEAU, MN.	-\$60;	SANDSTONE, MN.	-\$64;
SILVER BAY, MN.	-\$151;	THIEF RIVER FALLS, MN.	-\$131;	VIRGINIA, MN.	-\$60;	BLOOMFIELD, MO.	-\$142;
BROOKFIELD, MO.	-\$181;	CASSVILLE, MO.	-\$78;	DONIPHAN, MO.	-\$138;	FREDRICKTOWN, MO.	-\$135;
MOUNTAIN VIEW, MO.	-\$138;	POPULAR BLUFF, MO.	-\$142;	POTOSI, MO.	-\$135;	ROLLA, MO.	-\$143;
SALEM, MO.	-\$143;	SPRINGFIELD, MO.	-\$28;	VAN BUREN, MO.	-\$138;	WAYNESVILLE, MO.	-\$14;
COSHOCTON, OH.	-\$43;	ASHLAND, WI.	-\$38;	CRANDDON, WI.	-\$57;	HAYWARD, WI.	-\$79;
MEDFORD, WI.	-\$132;	PARK FALLS, WI.	-\$86;	PRAIRIE DU CHIEN, WI.	-\$12;	SPOONER, WI.	-\$91;
VIROQUA, WI.	-\$42;	WASHBURN, WI.	-\$143;				

\* - IF BOTH THE INTERIOR AND EXTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 3c MONTHLY BASE RENT - GOOD CONDITION 2 BDR, 1 BATH, HOUSES

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 2 BEDROOM, 1 BATHROOM HOUSES

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER -IOR/ INTER -IOR*	FAIR EXTER -IOR/ INTER -IOR*	POOR EXTER -IOR/ INTER -IOR*	A/C (REF)	GAR- AGE PER (CAR)	FIRE- PLACES	PLEX
300	\$390	\$382	\$373	\$365	\$357	\$348	\$332	\$+54	\$+12	\$-6	\$-12	\$+49	\$+39	\$+47	\$-9
400	\$394	\$386	\$377	\$369	\$361	\$352	\$336	\$+54	\$+16	\$-8	\$-15	\$+49	\$+39	\$+47	\$-12
500	\$398	\$390	\$381	\$373	\$365	\$356	\$340	\$+54	\$+20	\$-10	\$-17	\$+49	\$+39	\$+47	\$-15
600	\$402	\$394	\$385	\$377	\$369	\$360	\$344	\$+54	\$+24	\$-12	\$-19	\$+49	\$+39	\$+47	\$-18
700	\$406	\$398	\$389	\$381	\$373	\$364	\$348	\$+54	\$+28	\$-14	\$-22	\$+49	\$+39	\$+47	\$-21
800	\$410	\$402	\$393	\$385	\$377	\$368	\$352	\$+54	\$+32	\$-16	\$-24	\$+49	\$+39	\$+47	\$-24
900	\$414	\$406	\$397	\$389	\$381	\$372	\$356	\$+54	\$+36	\$-18	\$-27	\$+49	\$+39	\$+47	\$-27
1000	\$418	\$410	\$401	\$393	\$385	\$376	\$360	\$+54	\$+40	\$-20	\$-29	\$+49	\$+39	\$+47	\$-30
1100	\$422	\$414	\$405	\$397	\$389	\$380	\$364	\$+54	\$+44	\$-22	\$-31	\$+49	\$+39	\$+47	\$-33
1200	\$426	\$418	\$409	\$401	\$393	\$384	\$368	\$+54	\$+48	\$-24	\$-34	\$+49	\$+39	\$+47	\$-36
1300	\$430	\$422	\$413	\$405	\$397	\$388	\$372	\$+54	\$+52	\$-26	\$-36	\$+49	\$+39	\$+47	\$-39
1400	\$434	\$426	\$417	\$409	\$401	\$392	\$376	\$+54	\$+56	\$-28	\$-39	\$+49	\$+39	\$+47	\$-42
1500	\$438	\$430	\$421	\$413	\$405	\$396	\$380	\$+54	\$+60	\$-30	\$-41	\$+49	\$+39	\$+47	\$-45
1600	\$442	\$434	\$425	\$417	\$409	\$400	\$384	\$+54	\$+64	\$-32	\$-43	\$+49	\$+39	\$+47	\$-48
1700	\$446	\$438	\$429	\$421	\$413	\$404	\$388	\$+54	\$+68	\$-34	\$-46	\$+49	\$+39	\$+47	\$-51
1800	\$450	\$442	\$433	\$425	\$417	\$408	\$392	\$+54	\$+72	\$-36	\$-48	\$+49	\$+39	\$+47	\$-54
1900	\$454	\$446	\$437	\$429	\$421	\$412	\$396	\$+54	\$+76	\$-38	\$-51	\$+49	\$+39	\$+47	\$-57

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CENTRAL EVAPORATIVE AIR CONDITIONING      ADD    \$25                      CARPORT                                      ADD            \$24

FINISHED BASEMENT.....SUBTRACT \$43 MULTIPLIED BY THE FINISHED SQUARE FEET IN THE BASEMENT  
DIVIDED BY THE TOTAL FINISHED SQUARE FEET IN THE UNIT, IE: FINISHED  
BASEMENT SQFT = 500; TOTAL FINISHED SQFT = 1276;  
ADJUSTMENT = \$43 x (500 / 1276) = \$43 x .3918 = \$16.85.

COMMUNITY ADJUSTMENTS:

DANVILLE, IL.	-\$124;	HARRISBURG, IL.	-\$180;	HAVANA, IL.	-\$108;	JONESBORO, IL.	-\$149;
MARION, IL.	-\$51;	MURPHYSBORO, IL.	-\$97;	DALE, IN	-\$11;	GLADSTONE, MI	-\$26;
HOUGHTON, MI.	-\$26;	IRON MOUNTAIN, MI.	-\$168;	IRON RIVER, MI.	-\$168;	IRONWOOD, MI.	-\$122;
MANISTIQUE, MI.	-\$30;	MUNISING, MI.	-\$26;	NEWBERRY, MI.	-\$117;	ONTONAGON, MI.	-\$122;
REED CITY, MI.	-\$35;	ST. IGNACE, MI.	-\$117;	AURORA, MN.	-\$91;	DETROIT LAKES, MN.	-\$70;
ELY, MN.	-\$61;	GRAND RAPIDS, MN.	-\$55;	INTERNATNL FALLS, MN.	-\$98;	LITCHFIELD, MN.	-\$43;
PARK RAPIDS, MN.	-\$70;	PIPESTONE, MN.	-\$147;	ROSEAU, MN.	-\$60;	SANDSTONE, MN.	-\$64;
SILVER BAY, MN.	-\$151;	THIEF RIVER FALLS, MN.	-\$131;	VIRGINIA, MN.	-\$60;	BLOOMFIELD, MO.	-\$142;
BROOKFIEDLD, MO.	-\$181;	CASSVILLE, MO.	-\$78;	DONIPHAN, MO.	-\$138;	FREDRICKTOWN, MO.	-\$135;
MOUNTAIN VIEW, MO.	-\$138;	POPULAR BLUFF, MO.	-\$142;	POTOSI, MO.	-\$135;	ROLLA, MO.	-\$143;
SALEM, MO.	-\$143;	SPRINGFIELD, MO.	-\$28;	VAN BUREN, MO.	-\$138;	WAYNESVILLE, MO.	-\$14;
COSHOCTON, OH.	-\$43;	ASHLAND, WI.	-\$38;	CRANDDON, WI.	-\$57;	HAYWARD, WI.	-\$79;
MEDFORD, WI.	-\$132;	PARK FALLS, WI.	-\$86;	PRAIRIE DU CHIEN, WI.	-\$12;	SPOONER, WI.	-\$91;
VIROQUA, WI.	-\$42;	WASHBURN, WI.	-\$143;				

\* - IF BOTH THE INTERIOR AND EXTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 3d MONTHLY BASE RENT - GOOD CONDITION 1 BDR, 1 BATH, HOUSES

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 1 BEDROOM, 1 BATHROOM HOUSES

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER -IOR/ INTER -IOR*	FAIR EXTER -IOR/ INTER -IOR*	POOR EXTER -IOR/ INTER -IOR*	A/C (REF)	GAR- AGE PER (CAR)	FIRE- PLACES	PLEX
100	\$315	\$307	\$298	\$290	\$282	\$273	\$257	\$+54	\$+4	\$-2	\$-7	\$+49	\$+39	\$+47	\$-3
200	\$319	\$311	\$302	\$294	\$286	\$277	\$261	\$+54	\$+8	\$-4	\$-10	\$+49	\$+39	\$+47	\$-6
300	\$323	\$315	\$306	\$298	\$290	\$281	\$265	\$+54	\$+12	\$-6	\$-12	\$+49	\$+39	\$+47	\$-9
400	\$327	\$319	\$310	\$302	\$294	\$285	\$269	\$+54	\$+16	\$-8	\$-15	\$+49	\$+39	\$+47	\$-12
500	\$331	\$323	\$314	\$306	\$298	\$289	\$273	\$+54	\$+20	\$-10	\$-17	\$+49	\$+39	\$+47	\$-15
600	\$335	\$327	\$318	\$310	\$302	\$293	\$277	\$+54	\$+24	\$-12	\$-19	\$+49	\$+39	\$+47	\$-18
700	\$339	\$331	\$322	\$314	\$306	\$297	\$281	\$+54	\$+28	\$-14	\$-22	\$+49	\$+39	\$+47	\$-21
800	\$343	\$335	\$326	\$318	\$310	\$301	\$285	\$+54	\$+32	\$-16	\$-24	\$+49	\$+39	\$+47	\$-24
900	\$347	\$339	\$330	\$322	\$314	\$305	\$289	\$+54	\$+36	\$-18	\$-27	\$+49	\$+39	\$+47	\$-27
1000	\$351	\$343	\$334	\$326	\$318	\$309	\$293	\$+54	\$+40	\$-20	\$-29	\$+49	\$+39	\$+47	\$-30
1100	\$355	\$347	\$338	\$330	\$322	\$313	\$297	\$+54	\$+44	\$-22	\$-31	\$+49	\$+39	\$+47	\$-33
1200	\$359	\$351	\$342	\$334	\$326	\$317	\$301	\$+54	\$+48	\$-24	\$-34	\$+49	\$+39	\$+47	\$-36
1300	\$363	\$355	\$346	\$338	\$330	\$321	\$305	\$+54	\$+52	\$-26	\$-36	\$+49	\$+39	\$+47	\$-39
1400	\$367	\$359	\$350	\$342	\$334	\$325	\$309	\$+54	\$+56	\$-28	\$-39	\$+49	\$+39	\$+47	\$-42
1500	\$371	\$363	\$354	\$346	\$338	\$329	\$313	\$+54	\$+60	\$-30	\$-41	\$+49	\$+39	\$+47	\$-45

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CENTRAL EVAPORATIVE AIR CONDITIONING ADD \$25 CARPORT ADD \$24

FINISHED BASEMENT.....SUBTRACT \$43 MULTIPLIED BY THE FINISHED SQUARE FEET IN THE BASEMENT  
DIVIDED BY THE TOTAL FINISHED SQUARE FEET IN THE UNIT, IE: FINISED  
BASEMENT SQFT = 500; TOTAL FINISHED SQFT = 1276;  
ADJUSTMENT = \$43 x (500 / 1276) = \$43 x .3918 = \$16.85.

COMMUNITY ADJUSTMENTS:

DANVILLE, IL.	-\$124;	HARRISBURG, IL.	-\$180;	HAVANA, IL.	-\$108;	JONESBORO, IL.	-\$149;
MARION, IL.	-\$51;	MURPHYSBORO, IL.	-\$97;	DALE, IN	-\$11;	GLADSTONE, MI	-\$26;
HOUGHTON, MI.	-\$26;	IRON MOUNTAIN, MI.	-\$168;	IRON RIVER, MI.	-\$168;	IRONWOOD, MI.	-\$122;
MANISTIQUE, MI.	-\$30;	MUNISING, MI.	-\$26;	NEWBERRY, MI.	-\$117;	ONTONAGON, MI.	-\$122;
REED CITY, MI.	-\$35;	ST. IGNACE, MI.	-\$117;	AURORA, MN.	-\$91;	DETROIT LAKES, MN.	-\$70;
ELY, MN.	-\$61;	GRAND RAPIDS, MN.	-\$55;	INTERNATNL FALLS, MN.	-\$98;	LITCHFIELD, MN.	-\$43;
PARK RAPIDS, MN.	-\$70;	PIPESTONE, MN.	-\$147;	ROSEAU, MN.	-\$60;	SANDSTONE, MN.	-\$64;
SILVER BAY, MN.	-\$151;	THIEF RIVER FALLS, MN.	-\$131;	VIRGINIA, MN.	-\$60;	BLOOMFIELD, MO.	-\$142;
BROOKFIEDLD, MO.	-\$181;	CASSVILLE, MO.	-\$78;	DONIPHAN, MO.	-\$138;	FREDRICKTOWN, MO.	-\$135;
MOUNTAIN VIEW, MO.	-\$138;	POPULAR BLUFF, MO.	-\$142;	POTOSI, MO.	-\$135;	ROLLA, MO.	-\$143;
SALEM, MO.	-\$143;	SPRINGFIELD, MO.	-\$28;	VAN BUREN, MO.	-\$138;	WAYNESVILLE, MO.	-\$14;
COSHOCTON, OH.	-\$43;	ASHLAND, WI.	-\$38;	CRANDDON, WI.	-\$57;	HAYWARD, WI.	-\$79;
MEDFORD, WI.	-\$132;	PARK FALLS, WI.	-\$86;	PRAIRIE DU CHIEN, WI.	-\$12;	SPOONER, WI.	-\$91;
VIROQUA, WI.	-\$42;	WASHBURN, WI.	-\$143;				

\* - IF BOTH THE INTERIOR AND EXTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

## C. APARTMENTS

For all apartment units, use the rental chart which appropriately describes the housing class and the number of bedrooms of the subject quarters. The charts for apartments are in Tables 4a through 4d.

Assume a 2-bedroom, 2 bathroom apartment, near Minneapolis, MN with 760 square feet. The exterior is in poor condition; the interior is in good condition. The apartment, which was built in 1956, is 44 years old (2000 - 1956), has a carport, and central refrigerated air conditioning.

First, the two bedroom chart for good condition apartments (Table 4b) should be located and used. These charts are baseline charts, which assume that each apartment is in good condition inside and outside and has one full bathroom. Therefore, if the apartment is in good condition inside and outside and has one bathroom, no additional computations are needed. If there is a deviation from either good inside or outside condition or there are less or more bathrooms than one, then the computations must be changed as discussed below. In the first step, Table 4b is selected as the proper chart for 2-bedroom apartments.

In the second step the size (gross living area) is rounded **down** from 760 to 700 square feet. Under the column headed "**SQFT**" the figure 700 should be located. All further adjustments will be taken from this row.

In the third step the appropriate age column is selected. A 44-year old apartment is between 35 and 45 years old; therefore, the "**45 YRS OLD**" column should be used. A two-bedroom apartment, in good condition with 700 square feet of living space (gross), and which is 45 years of age, has a "Table Rent" of \$321 per month.

The first adjustment is the extra bathroom adjustment charge. Following the 700 SQFT row along to the column headed "**PER EXTRA BATHROOM**" you will find a charge of \$142. Add \$142 to the rent.

The second adjustment is for an poor exterior condition. Follow the 700 SQFT row across the table to the column headed "**POOR EXTERIOR/INTERIOR\***" a deduction of \$49 is shown. Table 4b assumes the condition to be good and since, in our example, the apartment's interior condition is good, therefore, no adjustment is needed for interior condition. Subtract \$49 for the poor exterior condition.

The third adjustment is for a carport. Beneath the table, under "**STRUCTURAL ADJUSTMENTS,**" there is an instruction to add \$25 for a carport of any size. As instructed add \$25 to the rent of this apartment.

The fourth adjustment is for central refrigerated air conditioning. Beneath the table, under "**STRUCTURAL ADJUSTMENTS,**" there is an instruction to add \$25 for Central Refrigerated Air Conditioning.

The final adjustment is the community adjustment. The apartment in this example is located near Minneapolis, MN. The notes beneath the table (see "**COMMUNITY ADJUSTMENTS**") show no adjustment for Minneapolis, MN. Therefore, rental values in Minneapolis, MN for apartments are equal to or greater than the regional average. Since positive community adjustments are not applied, no community adjustment is shown for Minneapolis, MN.

The last step is to round the resulting MBRR (Monthly Base Rental Rate) to the nearest whole dollar. Any amount resulting in an amount of \$.50 or greater is rounded up; any amount resulting in an amount of \$.49 or less is rounded down. The decision to round is discretionary.

In summary, the Monthly Base Rental Rate for the apartment in this example is determined as follows:

Table Rent (700 SQFT/45 years old) .....	\$321.00
Extra Bath Adjustment (1 X \$142) .....	+142.00
Poor Exterior Adjustment .....	-49.00
Carport Adjustment .....	+25.00
Central Refrigerated Air Conditioning Adjustment .....	+25.00
Location Adjustment (Minneapolis, MN) .....	<u>- 00.00</u>
Monthly Base Rental Rate .....	\$464.00

Monthly Base Rental Rate (Rounded) .....

\$464.00

TABLE 4a MONTHLY BASE RENT - GOOD CONDITION 3 BDR, 1 BATH, APTS

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 3 BEDROOM, 1 BATHROOM APARTMENTS

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER IOR/ INTER IOR*	FAIR EXTER- IOR/ INTER- IOR*	POOR EXTER- IOR/ INTER- IOR*	GAR- AGE (ANY SIZE)
600	\$356	\$344	\$338	\$334	\$331	\$328	\$324	\$+142	\$+20	\$-20	\$-42	\$+77
700	\$370	\$358	\$352	\$348	\$345	\$342	\$338	\$+142	\$+20	\$-20	\$-49	\$+77
800	\$384	\$372	\$366	\$362	\$359	\$356	\$352	\$+142	\$+20	\$-20	\$-56	\$+77
900	\$398	\$386	\$380	\$376	\$373	\$370	\$366	\$+142	\$+20	\$-20	\$-63	\$+77
1000	\$412	\$400	\$394	\$390	\$387	\$384	\$380	\$+142	\$+20	\$-20	\$-70	\$+77
1100	\$426	\$414	\$408	\$404	\$401	\$398	\$394	\$+142	\$+20	\$-20	\$-70	\$+77
1200	\$440	\$428	\$422	\$418	\$415	\$412	\$408	\$+142	\$+20	\$-20	\$-70	\$+77
1300	\$454	\$442	\$436	\$432	\$429	\$426	\$422	\$+142	\$+20	\$-20	\$-70	\$+77
1400	\$468	\$456	\$450	\$446	\$443	\$440	\$436	\$+142	\$+20	\$-20	\$-70	\$+77
1500	\$482	\$470	\$464	\$460	\$457	\$454	\$450	\$+142	\$+20	\$-20	\$-70	\$+77
1600	\$496	\$484	\$478	\$474	\$471	\$468	\$464	\$+142	\$+20	\$-20	\$-70	\$+77
1700	\$510	\$498	\$492	\$488	\$485	\$482	\$478	\$+142	\$+20	\$-20	\$-70	\$+77
1800	\$524	\$512	\$506	\$502	\$499	\$496	\$492	\$+142	\$+20	\$-20	\$-70	\$+77

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CARPORT (ANY SIZE): ADD \$25  
FIREPLACE(S): ADD \$25

CENTRAL REFRIGERATED AIR CONDITIONING ADD \$25  
CENTRAL EVAPORATIVE AIR CONDITIONING ADD \$15

COMMUNITY ADJUSTMENTS:

KNOXVILLE, IA. -\$16; SILVER BAY, MN. -\$146; VIRGINIA, MN. -\$22; DONIPHAN, MO. -\$80;  
JOPLIN, MO. -\$24; MOUNTAIN VIEW, MO. -\$63; HAYWARD, WI. -\$11;

\*IF BOTH THE EXTERIOR AND INTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 4b MONTHLY BASE RENT - GOOD CONDITION 2 BDR, 1 BATH, APTS

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 2 BEDROOM, 1 BATHROOM APARTMENTS

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER IOR/ INTER IOR*	FAIR EXTER- IOR/ INTER- IOR*	POOR EXTER- IOR/ INTER- IOR*	GAR- AGE (ANY SIZE)
400	\$303	\$292	\$286	\$282	\$279	\$276	\$272	\$+142	\$+20	\$-20	\$-28	\$+77
500	\$317	\$306	\$300	\$296	\$293	\$290	\$286	\$+142	\$+20	\$-20	\$-35	\$+77
600	\$331	\$320	\$314	\$310	\$307	\$304	\$300	\$+142	\$+20	\$-20	\$-42	\$+77
700	\$345	\$334	\$328	\$324	\$321	\$318	\$314	\$+142	\$+20	\$-20	\$-49	\$+77
800	\$359	\$348	\$342	\$338	\$335	\$332	\$328	\$+142	\$+20	\$-20	\$-56	\$+77
900	\$373	\$362	\$356	\$352	\$349	\$346	\$342	\$+142	\$+20	\$-20	\$-63	\$+77
1000	\$387	\$376	\$370	\$366	\$363	\$360	\$356	\$+142	\$+20	\$-20	\$-70	\$+77
1100	\$401	\$390	\$384	\$380	\$377	\$374	\$370	\$+142	\$+20	\$-20	\$-70	\$+77
1200	\$415	\$404	\$398	\$394	\$391	\$388	\$384	\$+142	\$+20	\$-20	\$-70	\$+77
1300	\$429	\$418	\$412	\$408	\$405	\$402	\$398	\$+142	\$+20	\$-20	\$-70	\$+77
1400	\$443	\$432	\$426	\$422	\$419	\$416	\$412	\$+142	\$+20	\$-20	\$-70	\$+77
1500	\$457	\$446	\$440	\$436	\$433	\$430	\$426	\$+142	\$+20	\$-20	\$-70	\$+77
1600	\$471	\$460	\$454	\$450	\$447	\$444	\$440	\$+142	\$+20	\$-20	\$-70	\$+77

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CARPORT (ANY SIZE): ADD \$25  
FIREPLACE(S): ADD \$25

CENTRAL REFRIGERATED AIR CONDITIONING ADD \$25  
CENTRAL EVAPORATIVE AIR CONDITIONING ADD \$15

COMMUNITY ADJUSTMENTS:

KNOXVILLE, IA. -\$16; SILVER BAY, MN. -\$146; VIRGINIA, MN. -\$22; DONIPHAN, MO. -\$80;  
JOPLIN, MO. -\$24; MOUNTAIN VIEW, MO. -\$63; HAYWARD, WI. -\$11;

\*IF BOTH THE EXTERIOR AND INTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 4c MONTHLY BASE RENT - GOOD CONDITION 1 BDR, 1 BATH, APTS

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 1 BEDROOM, 1 BATHROOM APARTMENTS

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER IOR/ INTER IOR*	FAIR EXTER- IOR/ INTER- IOR*	POOR EXTER- IOR/ INTER- IOR*	GAR- AGE (ANY SIZE)
300	\$258	\$247	\$241	\$237	\$234	\$231	\$227	\$+142	\$+20	\$-20	\$-21	\$+77
400	\$272	\$261	\$255	\$251	\$248	\$245	\$241	\$+142	\$+20	\$-20	\$-28	\$+77
500	\$286	\$275	\$269	\$265	\$262	\$259	\$255	\$+142	\$+20	\$-20	\$-35	\$+77
600	\$300	\$289	\$283	\$279	\$276	\$273	\$269	\$+142	\$+20	\$-20	\$-42	\$+77
700	\$314	\$303	\$297	\$293	\$290	\$287	\$283	\$+142	\$+20	\$-20	\$-49	\$+77
800	\$328	\$317	\$311	\$307	\$304	\$301	\$297	\$+142	\$+20	\$-20	\$-56	\$+77
900	\$342	\$331	\$325	\$321	\$318	\$315	\$311	\$+142	\$+20	\$-20	\$-63	\$+77
1000	\$356	\$345	\$339	\$335	\$332	\$329	\$325	\$+142	\$+20	\$-20	\$-70	\$+77
1100	\$370	\$359	\$353	\$349	\$346	\$343	\$339	\$+142	\$+20	\$-20	\$-70	\$+77
1200	\$384	\$373	\$367	\$363	\$360	\$357	\$353	\$+142	\$+20	\$-20	\$-70	\$+77
1300	\$398	\$387	\$381	\$377	\$374	\$371	\$367	\$+142	\$+20	\$-20	\$-70	\$+77
1400	\$412	\$401	\$395	\$391	\$388	\$385	\$381	\$+142	\$+20	\$-20	\$-70	\$+77
1500	\$426	\$415	\$409	\$405	\$402	\$399	\$395	\$+142	\$+20	\$-20	\$-70	\$+77

## ADDITIONAL ADJUSTMENTS:

## STRUCTURAL ADJUSTMENTS:

CARPORT (ANY SIZE): ADD \$25  
FIREPLACE(S): ADD \$25

CENTRAL REFRIGERATED AIR CONDITIONING ADD \$25  
CENTRAL EVAPORATIVE AIR CONDITIONING ADD \$15

## COMMUNITY ADJUSTMENTS:

KNOXVILLE, IA. -\$16; SILVER BAY, MN. -\$146; VIRGINIA, MN. -\$22; DONIPHAN, MO. -\$80;  
JOPLIN, MO. -\$24; MOUNTAIN VIEW, MO. -\$63; HAYWARD, WI. -\$11;

\*IF BOTH THE EXTERIOR AND INTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

TABLE 4d MONTHLY BASE RENT - GOOD CONDITION 0 BDR, 1 BATH, APTS

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART  
FOR GOOD CONDITION 0 BEDROOM, 1 BATHROOM APARTMENTS

SQFT	5 YRS OLD	15 YRS OLD	25 YRS OLD	35 YRS OLD	45 YRS OLD	55 YRS OLD	75+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER IOR/ INTER IOR*	FAIR EXTER- IOR/ INTER- IOR*	POOR EXTER- IOR/ INTER- IOR*	GAR- AGE (ANY SIZE)
100	\$187	\$175	\$169	\$165	\$162	\$159	\$155	\$+142	\$+20	\$-20	\$-7	\$+77
200	\$201	\$189	\$183	\$179	\$176	\$173	\$169	\$+142	\$+20	\$-20	\$-14	\$+77
300	\$215	\$203	\$197	\$193	\$190	\$187	\$183	\$+142	\$+20	\$-20	\$-21	\$+77
400	\$229	\$217	\$211	\$207	\$204	\$201	\$197	\$+142	\$+20	\$-20	\$-28	\$+77
500	\$243	\$231	\$225	\$221	\$218	\$215	\$211	\$+142	\$+20	\$-20	\$-35	\$+77
600	\$257	\$245	\$239	\$235	\$232	\$229	\$225	\$+142	\$+20	\$-20	\$-42	\$+77
700	\$271	\$259	\$253	\$249	\$246	\$243	\$239	\$+142	\$+20	\$-20	\$-49	\$+77
800	\$285	\$273	\$267	\$263	\$260	\$257	\$253	\$+142	\$+20	\$-20	\$-56	\$+77
900	\$299	\$287	\$281	\$277	\$274	\$271	\$267	\$+142	\$+20	\$-20	\$-63	\$+77
1000	\$313	\$301	\$295	\$291	\$288	\$285	\$281	\$+142	\$+20	\$-20	\$-70	\$+77
1100	\$327	\$315	\$309	\$305	\$302	\$299	\$295	\$+142	\$+20	\$-20	\$-70	\$+77

ADDITIONAL ADJUSTMENTS:

STRUCTURAL ADJUSTMENTS:

CARPORT (ANY SIZE): ADD \$25  
FIREPLACE(S): ADD \$25

CENTRAL REFRIGERATED AIR CONDITIONING ADD \$25  
CENTRAL EVAPORATIVE AIR CONDITIONING ADD \$15

COMMUNITY ADJUSTMENTS:

KNOXVILLE, IA. -\$16; SILVER BAY, MN. -\$146; VIRGINIA, MN. -\$22; DONIPHAN, MO. -\$80;  
JOPLIN, MO. -\$24; MOUNTAIN VIEW, MO. -\$63; HAYWARD, WI. -\$11;

\*IF BOTH THE EXTERIOR AND INTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

## D. MOBILE HOMES, TRAVEL TRAILERS, AND HOUSEBOATS

For these housing classes, use the mobile home base rental chart (Tables 5a). To familiarize the reader with these charts, assume a 490 square foot, 1-bedroom mobile home built in 1966 with a 3/4 bathroom. This mobile home is in poor interior and poor exterior condition and is located near Brookfield, MO. The Monthly Base Rental Rate for the mobile home in this example is calculated from Table 5a as follows.

The 1-bedroom chart for good condition mobile homes (Table 5a) should be located and used. These charts are baseline charts, which assume that each mobile home is in good condition inside and outside and has one full bathroom. Therefore, if the mobile home is in good condition inside and outside and has one full bathroom, no additional computations are needed. If there is a deviation from either good inside or outside condition or there are less or more bathrooms than one, then the computations must be changed accordingly.

First, locate the table for mobile homes in good condition with *one full bathroom* (Table 5a). Next, the gross square feet of living area should be rounded down to 400 square feet, and the **age** (2000 - 1966 = 34 years) is rounded **up** to 35+ years. The column headed "**SQFT**" is followed **down** to 400. All other adjustments are taken from this row. On this row, under the column headed "**35+ YRS OLD**," the "Table Rent" is \$268.

The base rental value of \$268 (computed above) includes the value of one full bathroom. Since the unit in this example has only a 3/4 bathroom, an adjustment must be made for the missing 1/4 bathroom. At the top of the table is a column titled "**PER EXTRA BATHROOM**." Follow this column down to the 400 SQFT row. A value of \$24 is shown. Multiply this value times .25 (1/4 bathroom) to calculate the value of the missing 1/4 bathroom ( $\$24 \times .25 = \$6.00$ ). Subtract \$6.00 from the rent.

The second and third adjustments are for the condition of the unit. Follow the 400 SQFT row to the column headed "**POOR EXTERIOR/INTERIOR\***"; subtract \$20 for the poor exterior condition and another \$20 for the poor interior condition.

The final adjustment is the community adjustment. The mobile home in this example is located near Brookfield, MO. The notes beneath the table (see "**COMMUNITY ADJUSTMENTS**") show an adjustment of -\$161 for Brookfield, MO. The rental values for mobile homes in Brookfield, MO are much lower than the survey area average. The rent for mobile homes which use Brookfield, MO as the nearest established community should be reduced by \$161.

The Monthly Base Rental Rate for this mobile home is shown below.

Table Rent (400 SQFT/35+ years old) .....	\$268.00
Bathroom Adjustment (.25 X \$24) .....	-6.00
Poor Exterior .....	- 20.00
Poor Interior .....	- 20.00
Location Adjustment (Brookfield, MO) .....	<u>-161.00</u>
Computed Monthly Base Rental Rate .....	\$61.00
Computed Monthly Base Rental Rate (Rounded) .....	\$61.00
Actual Monthly Base Rental Rate (Minimum Base) .....	\$100.00

Note: In this example, the Monthly Base Rental Rate computes to \$61.00, which is less than the \$100.00 minimum Monthly Base Rental Rate for the North Central Survey Region (refer to the footnotes on each rent table for the minimum base rent). Therefore, the Monthly Base Rental Rate for the mobile home in this example will be set at \$100.00. Keep in mind that the *Monthly Base Rental Rate* is different from the minimum monthly *final rent*. Thus, \$100.00 is not the minimum final rent possible.

The minimum base rent is set slightly higher than the average trailer pad rent for the region. The reasoning being that the base rent for a house, apartment, or mobile home should always be higher than a bare piece of ground.

TABLE 5a MONTHLY BASE RENT - GOOD CONDITION ANY # BDRS, 1 BATH, MOB HM

THE NORTH CENTRAL QUARTERS MONTHLY BASE RENT CHART FOR GOOD CONDITION, ANY # BEDROOM, 1 BATHROOM MOBILE HOMES											
SQFT	5 YRS OLD	10 YRS OLD	15 YRS OLD	20 YRS OLD	25 YRS OLD	30 YRS OLD	35+ YRS OLD	PER EXTRA BATH ROOM	EXCEL EXTER- IOR/ INTER- IOR*	FAIR EXTER- IOR/ INTER- IOR*	POOR EXTER- IOR/ INTER- IOR*
100	\$220	\$188	\$167	\$151	\$139	\$129	\$120	\$+24	\$+15	\$-15	\$-20
200	\$294	\$262	\$241	\$225	\$213	\$203	\$194	\$+24	\$+15	\$-15	\$-20
300	\$338	\$305	\$284	\$269	\$257	\$246	\$238	\$+24	\$+15	\$-15	\$-20
400	\$368	\$336	\$315	\$300	\$287	\$277	\$268	\$+24	\$+15	\$-15	\$-20
500	\$392	\$360	\$339	\$324	\$311	\$301	\$292	\$+24	\$+15	\$-15	\$-20
600	\$412	\$379	\$358	\$343	\$331	\$321	\$312	\$+24	\$+15	\$-15	\$-20
700	\$428	\$396	\$375	\$360	\$347	\$337	\$328	\$+24	\$+15	\$-15	\$-20
800	\$442	\$410	\$389	\$374	\$362	\$351	\$343	\$+24	\$+15	\$-15	\$-20
900	\$455	\$423	\$402	\$386	\$374	\$364	\$355	\$+24	\$+15	\$-15	\$-20
1000	\$466	\$434	\$413	\$398	\$385	\$375	\$366	\$+24	\$+15	\$-15	\$-20
1100	\$477	\$444	\$423	\$408	\$396	\$385	\$377	\$+24	\$+15	\$-15	\$-20
1200	\$486	\$454	\$433	\$417	\$405	\$395	\$386	\$+24	\$+15	\$-15	\$-20
1300	\$494	\$462	\$441	\$426	\$413	\$403	\$395	\$+24	\$+15	\$-15	\$-20
1400	\$502	\$470	\$449	\$434	\$421	\$411	\$402	\$+24	\$+15	\$-15	\$-20
1500	\$510	\$477	\$457	\$441	\$429	\$419	\$410	\$+24	\$+15	\$-15	\$-20
1600	\$517	\$484	\$463	\$448	\$436	\$425	\$417	\$+24	\$+15	\$-15	\$-20

STRUCTURAL ADJUSTMENTS:

GARAGE (ANY SIZE):	ADD	\$25
CARPORT (ANY SIZE):	ADD	\$20
CENTRAL REFRIGERATED AIR CONDITIONING	ADD	\$20
CENTRAL EVAPORATIVE AIR CONDITIONING	ADD	\$15

COMMUNITY ADJUSTMENTS:

WEST BRANCH, IA.	-\$43;	HOUGHTON, MI.	-\$65;	IRON RIVER, MI.	-\$192;	ELY, MN.	-\$64;
INTERNATIONAL FALLS, MN.	-\$29;	SILVER BAY, MN.	-\$64;	THIEF RIVER FALLS, MN.	-\$143;	BLOOMFIELD, MO.	-\$129;
BROOKFIELD, MO.	-\$161;	CASSVILLE, MO.	-\$35;	SALEM, MO.	-\$113;	CRANDON, WI.	-\$111;
VIROQUA, WI.	-\$90;						

\* - IF BOTH THE EXTERIOR AND INTERIOR ARE IN THIS CONDITION, APPLY THIS FACTOR TWICE.

REGARDLESS OF ADJUSTMENTS, THE MINIMUM BASE RENT IS \$100 PER MONTH.

THE APPROPRIATE CPI FACTOR SHOULD BE APPLIED AFTER COMPLETING THE ABOVE ADJUSTMENTS.

## E. CABINS OR LOOKOUTS

For purposes of rental rate establishment, the rental housing class most comparable to cabins or lookouts would be 1-bedroom, single-family houses, regardless of the number of bedrooms in the cabin.

One-bedroom, single-family rental houses generally consist of smaller and older housing units.

Where the cabins or lookouts are outfitted for housekeeping, and contain an independent primary heating system, the rental rates (including all applicable adjustments) are determined by using the 1-bedroom house chart (i.e. Table 3d).

Where a cabin or lookout lacks full housekeeping facilities (including running water, an inside heated bathroom, or a central heating system), additional adjustments (shown below) must be made to the Monthly Base Rental Rate. A free standing stove without a fan, or a fireplace does not qualify as a central primary heating system. These adjustments are designed to take into consideration the inconvenience resulting from the lack of full housekeeping facilities. However, the adjusted monthly base rental rate may not be set below the minimum monthly base rent of \$100.

. No Electricity =	- 20%
. No Inside Bathroom =	- 20%
. No Running Water =	- 20%
. No Central Heating System =	- 15% (*)
. Less Than Two Rooms (One-Room Cabin or Lookout) =	- 10%

(\*) Applied only if used during the heating season.

## F. BUNKHOUSE AND DORMITORIES

Bunkhouses and dormitories should only include housing units that have been specifically constructed or modified for use as bunkhouses or dormitories. Single-family houses, apartments or mobile homes that are **used** as dormitories or bunkhouses, must be valued as what they are (houses, apartments or mobile homes), with the rent divided by the number of **planned** occupants (normally 2 per bedroom).

Dormitory or bunkhouse units typically lack either a living room or kitchen, or have common baths and kitchens serving many people. Many also have multiple bunk beds in large ward-like rooms. Such housing units pose a valuation problem, as they are normally found only in association with institutions such as the military or colleges, of which its occupants are members. Since these institutions do not typically rent to the public at large, one cannot obtain an arms-length market rent.

Under circumstances where there is a lack of comparable rental data, OMB Circular A-45 provides that rental rates may be established using an extension of the Principle of Comparability. Under this procedure, rental rates are established using the most comparable rental housing available, and the rate is essentially 50 percent of the average house rent.

During the February, 1994 National Quarters Conference, the National Quarters Council decided that one aggregate monthly rate should be established for **all** dormitories in a survey region. This aggregate dormitory rate, which includes the value of Government-provided utilities, furnishings and services, was determined as follows.

An analysis of the comparables used in this survey found that the average single-family house had 1,358 square feet of finished floor space, 2.6 bedrooms and an average monthly adjusted contract rent of \$564. By applying an extension of the Principle of Comparability, the Base Shelter Rental Rate (BSRR) for bunkhouses and dormitories is calculated as shown below.

$$\text{Average adjusted contract rent} \times .5 = \$564 \times .5 = \$282.00$$

$$\begin{aligned} & \$282.00 / (\text{average \# of bedrooms} \times 2 \text{ occupants per bedroom}) \\ & \$282.00 / (2.6 \text{ bedrooms} \times 2 \text{ occupants}) = \$282.00 / 5.2 = \$54.25 \text{ per month/per occupant.} \end{aligned}$$

Charges were then added to this rate for utilities, services and furnishings that are provided by the Government. The aggregate value of these items was based on a study of the rates prevailing in the regional survey area. These charges were prorated based upon a 1,358 square foot, 2.6 bedroom, single-family house occupied by 2 people per bedroom. The aggregate charge for these related facilities is \$45.40.

Monthly, weekly, and daily bunkhouse and dormitory rates are computed as follows.

TABLE 6      BUNKHOUSE/DORMITORY RENTS

North Central

Monthly Charge

Dormitory Rate .....	\$54.25
Related Facilities Charges .....	<u>\$45.40</u>
MBRR .....	\$99.65

Bi-Weekly Charge

To convert to bi-weekly rate  
multiply MBRR by .4615 and  
round to nearest five cents ..... \$46.00

Weekly Charge

To convert to weekly rate  
multiply MBRR by .2308 and  
round to nearest five cents ..... \$23.00

Daily Charge

To convert to daily rate  
multiply MBRR by .0333 and  
round to nearest five cents ..... \$ 3.30

Note: An administrative adjustment of -10% is permitted if 3 or more people must share a bedroom or sleeping area.

## G. TRANSIENT QUARTERS

Transient quarters are those which are occupied on a transient basis, normally for a period of 90 days or less. Government provided transient quarters offer a range of accommodations. At some locations kitchen facilities, private telephones and private bathrooms may be available; at others, they are not provided. At some locations, maid service is provided (with varying degrees of frequency); at other locations, employees are "issued" bedding and other domestic items, and must take care of their own house keeping arrangements.

Given the diversity of facilities and services associated with Government-provided transient quarters, the QMIS National Quarters Council determined that private housing, comparable to Government transient quarters, generally does not exist. Accordingly, the rental charges for transient quarters have been established by extending the principle of comparability, as provided in OMB Circular A-45.

Essentially, the rental charge for transient quarters is the sum of the monthly dormitory rate (see Table 6); a monthly charge for maid service (Table 18); and a 20 percent administrative/service charge required by OMB Circular A-45 paragraph 7.c(4)(a). Monthly, weekly and daily charges for transient quarters are shown, below, in Table 7.

TABLE 7      TRANSIENT QUARTERS RENTS

Dormitory BSRR .....	\$54.25
Related Facilities Charges (Table 6) .....	45.40
Maid Service (Table 18) .....	<u>62.70</u>
Subtotal .....	\$162.35
Administrative Charge (OMB Cir. A-45) .....	<u>x 1.20</u>
Total (Rounded) .....	\$194.80
Monthly Charge (Rounded) .....	\$194.80
Bi-Weekly Charge (\$194.80 x .4615 Rounded) .....	\$89.90
Weekly Charge (\$194.80 x .2308 Rounded) .....	\$44.95
Daily Charge (\$194.80 x .0333 Rounded) .....	\$6.50

## H. TRAILER SPACES

During the course of the survey, trailer pads were surveyed in a wide variety of mobile home parks and varied widely in physical characteristics, utilities, rents, and geographical location.

A simplified analysis of this data was done. The value of related facilities in the contract rent was subtracted to arrive at an adjusted rent. After excluding extreme outliers, the average adjusted rent was determined for the remaining samples.

The average adjusted rent was then divided into the actual rent of each remaining sample. Those communities where the adjusted contract rents were significantly lower than the average rent for the region were given their typical adjusted rents. The rental rates of trailer pads in all other communities were established at the survey average rental level for the region.

During the February, 1993 National Quarters Conference, the National Quarters Officers of the agencies that participate in the Quarters Management Program agreed to assess the same monthly base rental rate (the rate for a single-wide space) for **all** GFQ trailer spaces. This is because most employees do not own/occupy double-wide mobile homes, and because the market differences are negligible.

To determine the trailer pad Monthly Base Rental Rate, use the applicable rate contained in Table 8. Do not use the rates in Table 8 if the trailer pad is occupied by a Government-owned or leased mobile home, as the land rent is already included in the base rent for all improved quarters.

If, as an example, the trailer pad is occupied by a tenant-owned mobile home located near Bemidji, MN, the base rent for this pad would be \$75 per month. If, for another example, the trailer space is located near Litchfield, MN, the base rental rate for this pad would be \$87 (the "All Other Locations" charge). No other adjustments are made for physical characteristics such as the date the trailer pad was installed, the front or square footage, or the total number of sites at that location.

However, all appropriate administrative adjustments (such as amenity and isolation adjustments), as well as all charges for Government provided related facilities (such as utilities and furnishings) should be applied to the Monthly Base Rental Rates in Table 8 to determine the monthly net rental charge.

TABLE 8 TRAILER SPACES - MONTHLY BASE RENTAL RATES

<u>COMMUNITIES</u>	<u>MONTHLY BASE RENTAL RATES</u>
MICHIGAN	
Iron River, MI	\$24
MINNESOTA	
Bemidji, MN	\$75
International Falls, MN	\$84
Thief River Falls, MN	\$52
MISSOURI	
Bloomfield, MO	\$38
Brookfield, MO	\$41
Cassville, MO	\$72
Salem, MO	\$52
ALL OTHER LOCATIONS	\$87

## I. OBSOLETE QUARTERS

OMB Circular A-45 revised October 20, 1993 excludes from the term rental quarters "... housing which due to extreme deterioration is unsuitable for occupancy except in exigent circumstances. ..." The net effect of this change means there will be no base rental rate for obsolete quarters. However, assessments will be made for utilities, furnishings, appliances and any other services that are provided by the Government.

The Department of the Interior Quarters Handbook (DQH), and the regulations of other QMIS program participants, provide that housing used as employee quarters must be safe, sanitary, and energy efficient. Where housing is in obsolete condition, it is by definition unfit for use as employee housing, and should be renovated, replaced, destroyed or used for non-residential purposes. Section 7.3A of the DQH also provides that the appropriate Program Assistant Secretary, or his/her designee (Bureau Head), may authorize temporary occupancy (for a period not to exceed one year), pending rehabilitation or replacement action where sufficient written justification is provided.

## VI. CHARGES FOR UTILITIES, APPLIANCES AND RELATED SERVICES

### A. BACKGROUND

OMB Circular A-45 requires that, whenever possible, utilities should be provided by a private company and billed directly to quarters occupants. Where Government-furnished utilities are provided, they should be metered or measured. When Government-furnished utilities are not metered or measured, consumption will be determined from an analysis of the average amounts of utilities used in comparable private housing in the nearest established community or survey area. **Where the Government furnishes utilities, and where the quarters rental rates are established by the regional survey method, the utility rates shall be the regional average utility rates prescribed in this report - not the rates prevailing in the nearest established community.**

The regional average utility rates contained in this report include all applicable delivery charges, adjustments, taxes and surcharges. Charges for Government-provided appliances, services and furnishings will be based upon nationwide average costs.

The following sections of this report detail the consumption and cost data to be used in the circumstances described above. The cost data in this report will be updated by the QMIS Program Office each year and distributed with the Consumer Price Index (CPI) adjustment that takes effect each year.

### B. ENERGY CONSUMPTION STUDY

1. **General.** Energy consumption estimates are required where the Government furnishes the space heating or cooling fuel and the electricity, and where consumption is neither metered nor measured. In such instances, average energy consumption must be estimated and the Government must assess a charge based on private sector energy costs in the survey area.

No methodology for estimating energy consumption can exactly predict the amounts of energy needed to heat or cool specific dwellings. Precise consumption measurements are possible only when metering is used. However, the methodology used in this report will yield **reasonable** estimates of the heating and cooling energy consumption requirements of unmetered dwellings. The methodology employed in this section was contractor-developed. For this report, however, the contractor-provided tables and conversion charts have been reformatted, and the methodology has been restated to simplify the process of estimating energy consumption requirements. The unit costs for various fuel types and for electricity (e.g., the cost per gallon for fuel oil and propane; the cost per MCF (1,000 cubic feet) for natural gas; and the cost per KWH for electricity) are regional averages of the unit fuel/electricity prices gathered by the contractor in each community surveyed.

2. **Housing Prototypes.** For the North Central energy study, estimates of the heating and cooling energy requirements were prepared for each of the following six prototypical housing units.

**Type I** - Single family, one story, no basement

**Type II** - Single family, one story, full basement

**Type III** - Single family, two story, no basement

**Type IV** - Single family, two story, full basement

**Type V** - Apartment unit

**Type VI** - Mobile Home

3. **Assumptions.** For each of the housing prototypes, the following assumptions were made:

- a. Location. - The housing is located in Springfield, IL.
- b. R values. - Each housing type has the R values of insulation in floors, walls, and ceilings recommended in the HUD Minimum Property Standards (HUD-MPS) for the Springfield, IL area.
- c. Occupants. - The housing contains an average compliment of occupants who are energy conscious (one person per 500 feet of floor space was assumed).
- d. All measurements are of finished living space only and are based upon exterior dimensions.
- e. Condition. - The housing is in good condition.
- f. Building shape. - A rectangular shape with a ratio of 2:1 was established. This provides more building skin than a square configuration therefore, the rectangular shape yields a conservative estimate of skin loads.

g. Window area. - A window area of 10 percent of wall area was used to match UBC (Uniform Building Code) minimum window area standards.

h. Roof type. - A flat or pitched roof with ceiling insulation was assumed in all cases.

i. Air changes. - 1.5 air changes per hour was established as representing a conservative estimate of air changes in residential applications.

j. Perimeter loss. - Approximately 10 percent of overall building load is attributed to the slab on grade floors with rigid insulation to a value of R-6.

4. Using the above assumptions, infiltration factors developed by the Department of Energy, R values, building dimensions, and cooling and heating degree days, a contractor has formulated methodologies for estimating British Thermal Unit (BTU) and kilowatt hour (KWH) consumption rates, and costs, for heating and cooling. The relevant portions of the methodology are explained below.

### C. SPACE HEATING (FOSSIL FUEL) CONSUMPTION/COST CALCULATIONS

To illustrate the procedure for calculating the cost of heating with fossil fuel, a single story 1,850 square foot house, with no basement, located near Chesterton, IN will be used as an example.

1. The first step is to select from among Tables 9a through 9f, the table which most closely describes the quarters unit at issue. In this case, Table 9a is for a 1-story, single family house with a partial (50 percent or less) or no basement (Prototype I). When determining the prototype, use the total basement (finished and unfinished) square footage. Unfinished space is only considered when determining the prototype. It is never used when using a rent setting or consumption chart. Table 9a should be selected in this example.

2. The second step is to determine the number of BTU's consumed **annually** for heating the house used in this example. Select from Table 9a the annual MBTU (million BTU's) consumption appropriate for the heating degree days (HDD's) and the gross **finished** square footage of the house in this example. Use the table as shown below.

a. Find the number of HDD's for the established community near which the quarters is located. Table 10 contains the HDD's for the nearest established communities in the North Central survey region; this table shows that Chesterton, IN has 6,291 HDD's. In Table 9a, 6,291 HDD's lies between the columns headed "**6,000**" and "**6,500**." Round 6,291 HDD's down to 6,000 HDD's.

b. In Table 9a, 1,850 square feet (the size of the house used in the example) lies between 1,800 and 2,000 square feet; round 1,850 down to 1,800 square feet.

c. From Table 9a (1,800 square feet and 6,000 HDD's) the annual MBTU consumption rate is 84.6 MBTU's.

3. The third step is to calculate the amount of fossil fuel needed to produce 84.6 MBTU's. Table 11 shows the amount of fossil fuel needed to produce 1 MBTU. The total amount of heating fuel required to

produce 84.6 MBTU's is computed by multiplying the appropriate fuel factor in Table 11 by the number of MBTU's. In this case the fuel required is:

<b>Natural gas:</b>	84.6 MBTU's x 1 MCF	= 84.6 MCF.
<b>Propane:</b>	84.6 MBTU's x 10.2 gallons	= 862.92 gallons
<b>Fuel oil:</b>	84.6 MBTU's x 7.04 gallons	= 595.58 gallons

4. The fourth step is to calculate the annual cost of the fuel consumed. This can be done by multiplying the annual fuel consumption by the unit fuel charges shown in Table 12. Following this procedure, the charge for fuel consumed annually to produce 84.6 MBTU's is:

<b>Natural gas:</b>	84.6 MCF x \$5.83 (per MCF)	= \$493.22
<b>Propane:</b>	862.92 gallons x \$1.03 (per gallon)	= \$888.81
<b>Fuel oil:</b>	595.58 gallons x \$1.19 (per gallon)	= \$708.74

5. The fifth step is to calculate the monthly charge for fossil heating fuel. This is done simply by dividing the annual charges (above) by 12 (months). In this manner the monthly charges are: natural gas = \$41.10; propane = \$74.07 and fuel oil = \$59.06.

6. The final step is to multiply the monthly charge (computed in step 5 above) by the appropriate HUD MPS Heating Zone conversion factor (Table 13). In order to use Table 13, it is first necessary to determine the HUD MPS Zone for the community at issue (Chesterton, IN). Table 10 shows the HUD MPS Zones for the nearest established communities located within the North Central survey region. From Table 10, it can be seen that Chesterton, IN is in MPS Zone 7. The conversion factor can now be found in Table 13. The conversion factor for a single story dwelling with no basement (Prototype I) in HUD MPS Zone 7 is 1.05. Multiply the monthly charges determined in step 5 above by 1.05 (the conversion factor). In this manner, the heating fuel charge can be computed for any quarters unit in any community or location. In this example, the final monthly fossil fuel heating costs are \$43.16 (\$41.10 x 1.05) for natural gas, \$77.77 (\$74.07 x 1.05) for propane and \$62.01 (\$59.06 x 1.05) for fuel oil.

The above example pertained to a single story dwelling with a partial (50 percent or less) or no basement. When calculating the heating fuel charge for a different type of housing (including apartments and mobile homes), use the Table (9a through f) which most closely describes the quarters unit to compute the annual MBTU consumption.

TABLE 9a      ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE I  
Single Family, One Story, Partial (Less Than 50%) or No Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	2.3	2.7	3.1	3.5	3.9	4.3	4.7	5.1	5.5	5.9	6.3	6.7	7.0	7.4	7.8	8.2
200	4.7	5.5	6.3	7.0	7.8	8.6	9.4	10.2	11.0	11.7	12.5	13.3	14.1	14.9	15.7	16.4
400	9.4	11.0	12.5	14.1	15.7	17.2	18.8	20.4	21.9	23.5	25.1	26.6	28.2	29.8	31.3	32.9
600	14.1	16.4	18.8	21.1	23.5	25.8	28.2	30.5	32.9	35.2	37.6	39.9	42.3	44.6	47.0	49.3
800	18.8	21.9	25.1	28.2	31.3	34.5	37.6	40.7	43.9	47.0	50.1	53.3	56.4	59.5	62.6	65.8
1000	23.5	27.4	31.3	35.2	39.2	43.1	47.0	50.9	54.8	58.7	62.6	66.6	70.5	74.4	78.3	82.2
1200	28.2	32.9	37.6	42.3	47.0	51.7	56.4	61.1	65.8	70.5	75.2	79.9	84.6	89.3	94.0	98.7
1400	32.9	38.4	43.9	49.3	54.8	60.3	65.8	71.3	76.7	82.2	87.7	93.2	98.7	104.2	109.6	115.1
1600	37.6	43.9	50.1	56.4	62.6	68.9	75.2	81.4	87.7	94.0	100.2	106.5	112.8	119.0	125.3	131.6
1800	42.3	49.3	56.4	63.4	70.5	77.5	84.6	91.6	98.7	105.7	112.8	119.8	126.9	133.9	141.0	148.0
2000	47.0	54.8	62.6	70.5	78.3	86.1	94.0	101.8	109.6	117.5	125.3	133.1	141.0	148.8	156.6	164.5
2200	51.7	60.3	68.9	77.5	86.1	94.8	103.4	112.0	120.6	129.2	137.8	146.4	155.1	163.7	172.3	180.9
2400	56.4	65.8	75.2	84.6	94.0	103.4	112.8	122.2	131.6	141.0	150.4	159.8	169.2	178.6	187.9	197.3
2600	61.1	71.3	81.4	91.6	101.8	112.0	122.2	132.3	142.5	152.7	162.9	173.1	183.3	193.4	203.6	213.8
2800	65.8	76.7	87.7	98.7	109.6	120.6	131.6	142.5	153.5	164.5	175.4	186.4	197.3	208.3	219.3	230.2
3000	70.5	82.2	94.0	105.7	117.5	129.2	141.0	152.7	164.5	176.2	187.9	199.7	211.4	223.2	234.9	246.7

TABLE 9b                      ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE II  
Single Family, Single Story, Full Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3
200	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.9	11.5	12.1	12.7
400	7.2	8.4	9.6	10.9	12.1	13.3	14.5	15.7	16.9	18.1	19.3	20.5	21.7	22.9	24.1	25.3
600	10.9	12.7	14.5	16.3	18.1	19.9	21.7	23.5	25.3	27.1	28.9	30.7	32.6	34.4	36.2	38.0
800	14.5	16.9	19.3	21.7	24.1	26.5	28.9	31.3	33.8	36.2	38.6	41.0	43.4	45.8	48.2	50.6
1000	18.1	21.1	24.1	27.1	30.1	33.2	36.2	39.2	42.2	45.2	48.2	51.2	54.3	57.3	60.3	63.3
1200	21.7	25.3	28.9	32.6	36.2	39.8	43.4	47.0	50.6	54.3	57.9	61.5	65.1	68.7	72.3	76.0
1400	25.3	29.5	33.8	38.0	42.2	46.4	50.6	54.9	59.1	63.3	67.5	71.7	76.0	80.2	84.4	88.6
1600	28.9	33.8	38.6	43.4	48.2	53.1	57.9	62.7	67.5	72.3	77.2	82.0	86.8	91.6	96.5	101.3
1800	32.6	38.0	43.4	48.8	54.3	59.7	65.1	70.5	76.0	81.4	86.8	92.2	97.7	103.1	108.5	113.9
2000	36.2	42.2	48.2	54.3	60.3	66.3	72.3	78.4	84.4	90.4	96.5	102.5	108.5	114.5	120.6	126.6
2200	39.8	46.4	53.1	59.7	66.3	72.9	79.6	86.2	92.8	99.5	106.1	112.7	119.4	126.0	132.6	139.3
2400	43.4	50.6	57.9	65.1	72.3	79.6	86.8	94.0	101.3	108.5	115.8	123.0	130.2	137.5	144.7	151.9
2600	47.0	54.9	62.7	70.5	78.4	86.2	94.0	101.9	109.7	117.6	125.4	133.2	141.1	148.9	156.7	164.6
2800	50.6	59.1	67.5	76.0	84.4	92.8	101.3	109.7	118.2	126.6	135.0	143.5	151.9	160.4	168.8	177.2
3000	54.3	63.3	72.3	81.4	90.4	99.5	108.5	117.6	126.6	135.6	144.7	153.7	162.8	171.8	180.9	189.9

TABLE 9c ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE III  
Single Family, Two Story, Partial (Less Than 50%) or No Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	2.0	2.4	2.7	3.1	3.4	3.7	4.1	4.4	4.8	5.1	5.4	5.8	6.1	6.5	6.8	7.1
200	4.1	4.8	5.4	6.1	6.8	7.5	8.2	8.8	9.5	10.2	10.9	11.6	12.3	12.9	13.6	14.3
400	8.2	9.5	10.9	12.3	13.6	15.0	16.3	17.7	19.1	20.4	21.8	23.1	24.5	25.9	27.2	28.6
600	12.3	14.3	16.3	18.4	20.4	22.5	24.5	26.5	28.6	30.6	32.7	34.7	36.8	38.8	40.8	42.9
800	16.3	19.1	21.8	24.5	27.2	30.0	32.7	35.4	38.1	40.8	43.6	46.3	49.0	51.7	54.5	57.2
1000	20.4	23.8	27.2	30.6	34.0	37.4	40.8	44.2	47.7	51.1	54.5	57.9	61.3	64.7	68.1	71.5
1200	24.5	28.6	32.7	36.8	40.8	44.9	49.0	53.1	57.2	61.3	65.4	69.4	73.5	77.6	81.7	85.8
1400	28.6	33.4	38.1	42.9	47.7	52.4	57.2	61.9	66.7	71.5	76.2	81.0	85.8	90.5	95.3	100.1
1600	32.7	38.1	43.6	49.0	54.5	59.9	65.4	70.8	76.2	81.7	87.1	92.6	98.0	103.5	108.9	114.4
1800	36.8	42.9	49.0	55.1	61.3	67.4	73.5	79.6	85.8	91.9	98.0	104.2	110.3	116.4	122.5	128.7
2000	40.8	47.7	54.5	61.3	68.1	74.9	81.7	88.5	95.3	102.1	108.9	115.7	122.5	129.3	136.2	143.0
2200	44.9	52.4	59.9	67.4	74.9	82.4	89.9	97.3	104.8	112.3	119.8	127.3	134.8	142.3	149.8	157.3
2400	49.0	57.2	65.4	73.5	81.7	89.9	98.0	106.2	114.4	122.5	130.7	138.9	147.0	155.2	163.4	171.5
2600	53.1	61.9	70.8	79.6	88.5	97.3	106.2	115.0	123.9	132.7	141.6	150.4	159.3	168.1	177.0	185.8
2800	57.2	66.7	76.2	85.8	95.3	104.8	114.4	123.9	133.4	143.0	152.5	162.0	171.5	181.1	190.6	200.1
3000	61.3	71.5	81.7	91.9	102.1	112.3	122.5	132.7	143.0	153.2	163.4	173.6	183.8	194.0	204.2	214.4

TABLE 9d ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE IV  
Single Family, Two Story, Full Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	2.2	2.6	3.0	3.4	3.7	4.1	4.5	4.9	5.2	5.6	6.0	6.4	6.7	7.1	7.5	7.9
200	4.5	5.2	6.0	6.7	7.5	8.2	9.0	9.7	10.5	11.2	12.0	12.7	13.5	14.2	15.0	15.7
400	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0	31.5
600	13.5	15.7	18.0	20.2	22.5	24.7	27.0	29.2	31.5	33.7	36.0	38.2	40.4	42.7	44.9	47.2
800	18.0	21.0	24.0	27.0	30.0	33.0	36.0	38.9	41.9	44.9	47.9	50.9	53.9	56.9	59.9	62.9
1000	22.5	26.2	30.0	33.7	37.5	41.2	44.9	48.7	52.4	56.2	59.9	63.7	67.4	71.2	74.9	78.6
1200	27.0	31.5	36.0	40.4	44.9	49.4	53.9	58.4	62.9	67.4	71.9	76.4	80.9	85.4	89.9	94.4
1400	31.5	36.7	41.9	47.2	52.4	57.7	62.9	68.2	73.4	78.6	83.9	89.1	94.4	99.6	104.9	110.1
1600	36.0	41.9	47.9	53.9	59.9	65.9	71.9	77.9	83.9	89.9	95.9	101.9	107.9	113.8	119.8	125.8
1800	40.4	47.2	53.9	60.7	67.4	74.2	80.9	87.6	94.4	101.1	107.9	114.6	121.3	128.1	134.8	141.6
2000	44.9	52.4	59.9	67.4	74.9	82.4	89.9	97.4	104.9	112.4	119.8	127.3	134.8	142.3	149.8	157.3
2200	49.4	57.7	65.9	74.2	82.4	90.6	98.9	107.1	115.3	123.6	131.8	140.1	148.3	156.5	164.8	173.0
2400	53.9	62.9	71.9	80.9	89.9	98.9	107.9	116.8	125.8	134.8	143.8	152.8	161.8	170.8	179.8	188.7
2600	58.4	68.2	77.9	87.6	97.4	107.1	116.8	126.6	136.3	146.1	155.8	165.5	175.3	185.0	194.7	204.5
2800	62.9	73.4	83.9	94.4	104.9	115.3	125.8	136.3	146.8	157.3	167.8	178.3	188.7	199.2	209.7	220.2
3000	67.4	78.6	89.9	101.1	112.4	123.6	134.8	146.1	157.3	168.5	179.8	191.0	202.2	213.5	224.7	235.9

TABLE 9e ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE V  
Apartments

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	1.5	1.7	2.0	2.2	2.4	2.7	2.9	3.2	3.4	3.7	3.9	4.2	4.4	4.7	4.9	5.1
200	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.3	7.8	8.3	8.8	9.3	9.8	10.3
400	5.9	6.9	7.8	8.8	9.8	10.8	11.8	12.7	13.7	14.7	15.7	16.7	17.6	18.6	19.6	20.6
600	8.8	10.3	11.8	13.2	14.7	16.2	17.6	19.1	20.6	22.0	23.5	25.0	26.5	27.9	29.4	30.9
800	11.8	13.7	15.7	17.6	19.6	21.6	23.5	25.5	27.4	29.4	31.4	33.3	35.3	37.2	39.2	41.2
1000	14.7	17.1	19.6	22.0	24.5	26.9	29.4	31.8	34.3	36.7	39.2	41.6	44.1	46.5	49.0	51.4
1200	17.6	20.6	23.5	26.5	29.4	32.3	35.3	38.2	41.2	44.1	47.0	50.0	52.9	55.9	58.8	61.7
1400	20.6	24.0	27.4	30.9	34.3	37.7	41.2	44.6	48.0	51.4	54.9	58.3	61.7	65.2	68.6	72.0
1600	23.5	27.4	31.4	35.3	39.2	43.1	47.0	51.0	54.9	58.8	62.7	66.6	70.6	74.5	78.4	82.3
1800	26.5	30.9	35.3	39.7	44.1	48.5	52.9	57.3	61.7	66.1	70.6	75.0	79.4	83.8	88.2	92.6
2000	29.4	34.3	39.2	44.1	49.0	53.9	58.8	63.7	68.6	73.5	78.4	83.3	88.2	93.1	98.0	102.9
2200	32.3	37.7	43.1	48.5	53.9	59.3	64.7	70.1	75.5	80.8	86.2	91.6	97.0	102.4	107.8	113.2
2400	35.3	41.2	47.0	52.9	58.8	64.7	70.6	76.4	82.3	88.2	94.1	100.0	105.8	111.7	117.6	123.5
2600	38.2	44.6	51.0	57.3	63.7	70.1	76.4	82.8	89.2	95.5	101.9	108.3	114.7	121.0	127.4	133.8
2800	41.2	48.0	54.9	61.7	68.6	75.5	82.3	89.2	96.0	102.9	109.8	116.6	123.5	130.3	137.2	144.1
3000	44.1	51.4	58.8	66.1	73.5	80.8	88.2	95.5	102.9	110.2	117.6	124.9	132.3	139.6	147.0	154.3

TABLE 9f ANNUAL MBTU USAGE (MILLIONS BTU'S) - PROTOTYPE VI  
Mobile Homes

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING DEGREE DAYS															
	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000	10500
100	3.8	4.5	5.1	5.7	6.4	7.0	7.6	8.3	8.9	9.6	10.2	10.8	11.5	12.1	12.7	13.4
200	7.6	8.9	10.2	11.5	12.7	14.0	15.3	16.6	17.8	19.1	20.4	21.7	22.9	24.2	25.5	26.8
400	15.3	17.8	20.4	22.9	25.5	28.0	30.6	33.1	35.7	38.2	40.8	43.3	45.9	48.4	51.0	53.5
600	22.9	26.8	30.6	34.4	38.2	42.1	45.9	49.7	53.5	57.4	61.2	65.0	68.8	72.7	76.5	80.3
800	30.6	35.7	40.8	45.9	51.0	56.1	61.2	66.3	71.4	76.5	81.6	86.7	91.8	96.9	102.0	107.1
1000	38.2	44.6	51.0	57.4	63.7	70.1	76.5	82.9	89.2	95.6	102.0	108.4	114.7	121.1	127.5	133.9
1200	45.9	53.5	61.2	68.8	76.5	84.1	91.8	99.4	107.1	114.7	122.4	130.0	137.7	145.3	153.0	160.6
1400	53.5	62.5	71.4	80.3	89.2	98.2	107.1	116.0	124.9	133.9	142.8	151.7	160.6	169.6	178.5	187.4
1600	61.2	71.4	81.6	91.8	102.0	112.2	122.4	132.6	142.8	153.0	163.2	173.4	183.6	193.8	204.0	214.2
1800	68.8	80.3	91.8	103.3	114.7	126.2	137.7	149.2	160.6	172.1	183.6	195.1	206.5	218.0	229.5	241.0
2000	76.5	89.2	102.0	114.7	127.5	140.2	153.0	165.7	178.5	191.2	204.0	216.7	229.5	242.2	255.0	267.7
2200	84.1	98.2	112.2	126.2	140.2	154.3	168.3	182.3	196.3	210.4	224.4	238.4	252.4	266.4	280.5	294.5
2400	91.8	107.1	122.4	137.7	153.0	168.3	183.6	198.9	214.2	229.5	244.8	260.1	275.4	290.7	306.0	321.3
2600	99.4	116.0	132.6	149.2	165.7	182.3	198.9	215.5	232.0	248.6	265.2	281.7	298.3	314.9	331.5	348.0
2800	107.1	124.9	142.8	160.6	178.5	196.3	214.2	232.0	249.9	267.7	285.6	303.4	321.3	339.1	357.0	374.8
3000	114.7	133.9	153.0	172.1	191.2	210.4	229.5	248.6	267.7	286.8	306.0	325.1	344.2	363.3	382.5	401.6

TABLE 10 HEATING/COOLING DEGREE DAYS AND MPS ZONES

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
ILLINOIS			
Carterville, IL	4,681	1,208	4
Chicago, IL	6,536	752	4
Danville, IL	5,610	1,005	4
Harrisburg, IL	4,565	1,567	4
Havana, IL	5,753	1,144	6
Hines, IL	6,536	752	4
Jonesboro, IL	4,406	1,430	4
Marion, IL	4,681	1,208	4
Murphysboro, IL	4,563	1,395	4
Springfield, IL	5,654	1,165	6
INDIANA			
Chesterton, IN	6,291	690	7
Dale, IN	4,666	1,345	4
Indianapolis, IN	5,615	1,014	5
Marion, IN	6,260	760	5
Seymour, IN	5,434	975	5
Tell City, IN	4,666	1,345	4
Terre Haute, IN	5,521	1,049	5
IOWA			
Des Moines, IA	6,497	1,036	7
Knoxville, IA	6,403	981	7
Missouri Valley, IA	6,419	1,010	7
West Branch, IA	6,376	968	7
MICHIGAN			
Ausable, MI	7,682	290	8
Battle Creek, MI	6,677	575	8
East Tawas, MI	7,682	290	8
Frankfort, MI	7,153	380	8
Fremont, MI	7,398	412	8
Gaylord, MI	8,178	297	8
Gladstone, MI	8,228	183	8
Grayling, MI	8,189	324	8
Houghton, MI	8,228	183	8
Iron Mountain, MI	8,692	236	8

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
MICHIGAN			
Iron River, MI	9,269	215	8
Ironwood, MI	9,190	276	8
Manistee, MI	7,067	414	8
Manistique, MI	8,664	107	8
Milan, MI	6,346	723	8
Munsing, MI	8,274	184	8
Newberry, MI	8,986	158	8
Ontonagon, MI	7,103	501	8
Oscoda, MI	7,682	290	8
Reed City, MI	7,630	390	8
St. Ignace, MI	8,233	184	8
Saginaw, MI	7,103	380	8
Traverse City, MI	7,795	380	8
MINNESOTA			
Aitkin, MN	9,089	453	8
Aurora, MN	9,843	267	8
Bemidji, MN	10,203	278	8
Detroit Lakes, MN	9,853	304	8
Duluth, MN	9,901	150	8
Ely, MN	9,552	331	8
Grand Rapids, MN	9,535	252	8
International Falls, MN	10,462	216	8
Litchfield, MN	8,219	632	8
Minneapolis, MN	7,981	682	8
Park Rapids, MN	9,597	337	8
Pipestone, MN	8,540	557	8
Princeton, MN	8,795	423	8
Roseau, MN	10,462	275	8
Sandstone, MN	9,099	391	8
Silver Bay, MN	9,230	151	8
Thief River Falls, MN	9,709	388	8
Virginia, MN	9,843	267	8

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
MISSOURI			
Bloomfield, MO	3,732	1,840	4
Brookfield, MO	5,240	1,385	6
Cassville, MO	4,716	1,222	4
Doniphan, MO	4,254	1,480	4
Fredricktown, MO	4,870	1,200	4
Houston, MO	4,450	1,332	4
Joplin, MO	4,321	1,628	4
Monett, MO	4,557	1,302	4
Mountain View, MO	4,383	1,292	4
Potosi, MO	4,721	1,359	4
Rolla, MO	4,811	1,346	4
Salem, MO	4,799	1,226	4
Springfield, MO	4,660	1,374	4
NEBRASKA			
Falls City, NE	5,453	1,276	6
OHIO			
Akron, OH	6,241	625	6
Caldwell, OH	5,549	752	6
Chillicothe, OH	5,156	943	6
Cincinnati, OH	4,988	1,153	6
Cleveland, OH	6,201	621	7
Coshocton, OH	5,891	657	6
Dayton, OH	5,365	1,170	6
Ironton, OH	4,495	1,247	6
Oak Harbor, OH	6,138	671	6
Port Clinton, OH	6,016	821	6
WISCONSIN			
Ashland, WI	9,060	227	8
Crandon, WI	8,945	315	8
Hayward, WI	8,811	358	8
Antigo, WI	8,624	301	8
Maryville, WI	7,522	467	8

<u>Community</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>HUD MPS Zone</u>
WISCONSIN			
Medford, WI	8,911	258	8
Osceola, WI	8,093	538	8
Park Falls, WI	9,147	242	8
Prairie Du Chien, WI	6,927	242	8
Rhineland, WI	6,927	820	8
Spoooner, WI	8,811	358	8
Tomah, WI	7,802	531	8
Viroqua, WI	7,849	487	8
Washburn, WI	9,060	227	8

TABLE 11 FUEL REQUIRED TO PRODUCE 1 MBTU

<u>Type of Fuel</u>	<u>Amount Needed To Produce 1 MBTU</u>
Natural Gas	1 MCF (1,000 cu. ft.)
Propane	10.2 Gallons
Fuel Oil	7.04 Gallons

TABLE 12 HEATING FUEL COST

<u>Type of Fuel</u>	<u>Charge per unit</u>
Natural Gas	\$5.83
Propane	\$1.03
Fuel Oil #2	\$1.19

TABLE 13 MPS HEATING ZONE CONVERSION FACTORS

	Dwelling Prototypes					
	I	II	III	IV	V	VI
HUD MPS Heating Zone	Single Story No Basement	Single Story Full Basement	Double Story No Basement	Double Story Full Basement	Apartments	Mobile Homes
1						
2						
3						
4	.92	.89	.90	.91	.87	.91
5	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00
7	1.05	1.07	1.06	1.06	1.09	1.06
8	.95	.93	.94	.94	.91	.94

#### D. SPACE HEATING (ELECTRICITY) CONSUMPTION/COST CALCULATIONS

The procedure for calculating electrical consumption and costs for space heating (where electricity is unmetered or otherwise unmeasured) is similar to the procedure used for fossil fuels. Tables 14a through 14f are used.

1. Select from these tables the dwelling prototype most similar to the quarters at issue.
2. Determine the annual kilowatt hour (KWH) consumption by finding the appropriate columns for square feet and HDD (heating degree days). Note: HDD's for the nearest established communities may be found in Table 10.
3. Divide the annual KWH by 12 to determine the monthly average electrical consumption.
4. Adjust for HUD MPS Heating Zone, using the conversion factors in Table 13.
5. Adjust for heat pump (if applicable).
6. Determine the appropriate charge per KWH from the table below. **Do not calculate the total cost of electricity in steps such as the first 500 KWH costs so much, then the second 500 KWH costs so much etc.**

<u>KWH Consumed Per Month</u>	<u>Charge per KWH</u>
1 -500	\$.084
501 - 1,000	\$.078
1,001 -1,500	\$.076
Over - 1,500	\$.075

7. Compute the monthly charge for space heating by multiplying the appropriate charge per KWH times the number of KWH consumed per month.

8. Example: The average monthly electric heating charge for a single family, 2,100 square foot, two story, no basement home located near Frankfort, MI is computed as follows:

a. Step 1. Select the table (table 14a through f) which most closely describes the quarters unit at issue. In this case, table 14c (single family, two story, no basement - prototype III) should be selected.

b. Step 2. Determine from table 14c the annual KWH consumption appropriate for the heating degree days (HDD) and the gross square footage of the house in this example. Use the table as follows:

(1) Find the number of heating degree days for the established community in which the quarters is located. Table 10 (which contains the HDD for established communities in the North Central survey

region) shows that Frankfort, MI has 7,153 HDD . In table 14c, the number of HDD's in Frankfort, MI (7,153) lies between the column headed 6,500 and the column headed 7,500. Round down to 6,500 HDD.

(2) In table 14c, 2,100 square feet (the size of the house used in this example) lies between 2,000 and 2,200 square feet. Round 2,100 down to 2,000 square feet.

(3) From table 14c (2,000 square feet and 6,500 HDD) the annual KWH consumption rate is 20,744 KWH.

c. Step 3. Calculate the monthly KWH consumption by dividing the annual KWH by 12 (months). In this instance, the monthly consumption is 1,728.67 KWH ( $20,744 / 12 = 1,728.67$ ).

d. Step 4, HUD MPS Zone adjustment. The HUD MPS zone adjustment is made as follows:

1) Use Table 10 to find the HUD MPS zone for the community at issue. In this manner, Frankfort, MI is found to be in HUD MPS zone 8.

2) In Table 13, determine the adjustment factor for the appropriate dwelling type and MPS zone. The factor for housing prototype III in HUD MPS zone 8 is 0.94.

3) Multiply the monthly electric consumption (as computed in paragraph 8c, above) times the HUD MPS adjustment factor ( $1,728.67 \times 0.94 = 1,624.95$  KWH per month).

e. Step 5, **Adjustment for heat pump.** The process described above is used for computing the electrical consumption for heating with a straight resistance heating system. Where a dwelling is heated with an electric heat pump, the straight resistance heating consumption (1,624.95 KWH in this example) should be multiplied by a factor of .75 which represents the greater efficiency of the heat pump. In this example, the monthly electric consumption for a heat pump as the heating source would be 1,218.71 ( $1,624.95 \times .75 = 1,218.71$ ).

f. Step 6. The final step is to compute the monthly charge for the electricity consumed. This is done by multiplying the charge per KWH times the KWH consumed per month. The appropriate charge per KWH may be found in the table below.

<u>KWH Consumed Per Month</u>	<u>Charge per KWH</u>
1 - 500	\$.084
501 - 1,000	\$.078
1,001 - 1,500	\$.076
Over - 1,500	\$.075

In this example, the average monthly consumption (1,624.95 KWH) for resistance heat falls in the "Over - 1,500" KWH per month consumption category; the appropriate charge is \$.075 per KWH. The average monthly consumption (1,218.71 KWH) for a heat pump falls in the "1,001 - 1,500" KWH per month consumption category; and the appropriate unit charge is \$.076 per KWH.

Therefore, the monthly electric heating charge for the house used in this example is computed as follows:

Resistance heat: 1,624.95 KWH x \$.075 = \$121.87

Heatpump: 1,218.71 KWH x \$.076 = \$92.62

#### E. SPACE COOLING CONSUMPTION/COST

Space cooling costs are calculated in the same manner as for electric space heating except that CDD (Cooling Degree Day) values are used in lieu of HDD values. CDD values for the Nearest Established Communities are found in Table 10. Additionally, only Tables 14a through 14f are used in calculating cooling energy consumption. Briefly, the steps are as follows.

1. Select from Tables 14a through 14f, the table that most closely describes the quarters unit at issue.
2. Based on the size of the dwelling (square feet) and the number of CDD (from Table 10), use the appropriate Table (14a-f) to determine the annual KWH consumption.
3. Divide the annual KWH consumption by 12 (months) to determine the average number of KWH consumed per month.
4. Apply the HUD MPS Zone adjustment factor.
5. Apply the Coefficient of Performance (COP) adjustment.
6. Determine the appropriate charge per KWH from the table below.

<u>KWH Consumed Per Month</u>	<u>Charge per KWH</u>
1 - 500	\$.084
501 - 1,000	\$.078
1,001 - 1,500	\$.076
Over - 1,500	\$.075

7. Compute the monthly charge for space cooling by multiplying the appropriate charge per KWH times the number of KWH consumed per month.

8. Example : Compute the average monthly electric cooling charge for a 1,275 SQFT mobile home near Harrisburg, IL.

a. STEP 1: Table Selection. Select the table (table 14a through 14f) which most closely describes the quarters unit at issue. Table 14f (Mobile Home - prototype VI) should be selected.

b. STEP 2: Annual KWH Consumption. Determine from table 14f the annual KWH consumption appropriate for the cooling degree days (CDD) and the gross square footage of the apartment in this example. Use the table as follows:

(1) Find the number of cooling degree days for the established community closest to the quarters. Table 10 (which contains the CDD for established communities in the North Central survey region) shows that Harrisburg, IL has 1,567 CDD. In table 14f, 1,567 CDD lies between the columns headed 1,350 and 1,600. Round down to 1,350 CDD.

(2) In table 14f, 1,275 square feet (the size of the mobile home used in this example) lies between 1,200 and 1,400 square feet. Round down to 1,200 square feet.

(3) From table 14f (1,200 square feet and 1,350 CDD) the annual KWH consumption rate is 4,841 KWH.

c. STEP 3: Monthly Consumption. Calculate the monthly KWH consumption by dividing the annual KWH consumption by 12 (months). In this instance, the monthly consumption is 403.42 KWH rounded ( $4,841 / 12 = 403.42$ ).

d. STEP 4: HUD MPS Zone Adjustment. The HUD MPS Zone adjustment is made as follows:

(1) Use Table 10 to find the HUD MPS zone for the community at issue. In this manner, Harrisburg, IL is found to be in HUD MPS Zone 4.

(2) In Table 15, determine the adjustment factor for the appropriate dwelling unit type and MPS zone. The factor for housing prototype VI in HUD MPS zone 4 is 2.15.

(3) Multiply the monthly electric consumption (as computed in paragraph 8c, above) times the HUD MPS Zone adjustment factor  $403.42 \times 2.15 = 867.35$  KWH per month.

e. STEP 5: Adjustment for Coefficient of Performance (COP). This adjustment accounts for the differences in the efficiencies of evaporative (swamp) and refrigerated air central cooling systems.

(1) Evaporative (swamp) cooling. For a central evaporative cooling system the adjusted KWH (computed in Step 4, above) is divided by a factor of 6.66. In this example, the monthly KWH requirement for central evaporative cooling is computed as  $867.35 / 6.66 = 130.23$  KWH per month.

(2) Refrigerated air cooling. For a central refrigerated air cooling system, the adjusted KWH (computed in step 4, above) is divided by a factor of 2. In this example, the monthly KWH requirement for central refrigerated air cooling is computed as  $867.35 / 2 = 433.68$  KWH per month.

f. STEP 6: Monthly Charge. The final step is to compute the monthly charge for the electricity consumed. This is done by multiplying the charge per KWH times the KWH consumed per month. The appropriate charge per KWH may be found in the table below.

<u>KWH Consumed Per Month</u>	<u>Charge per KWH</u>
1 - 500	\$.084
501 - 1,000	\$.078
1,001 - 1,500	\$.076
Over - 1,500	\$.075

In this example, the average monthly consumption (130.23 KWH) for evaporative cooling falls in the 1 to 500 KWH consumption range. And (433.68 KWH) for refrigerated cooling falls in the 1 to 500 KWH consumption range. The appropriate charge will be \$.084 per KWH for evaporative cooling and \$.084 for refrigerated cooling.

Therefore, the monthly charges for cooling the mobile home used in this example would be computed as follows.

Evaporative cooling :  $130.23 \text{ KWH} \times \$0.084 = \$10.94$

Refrigerated cooling:  $433.68 \text{ KWH} \times \$0.084 = \$36.43$

9. Gas powered Central Air Conditioning Units. If the central air conditioning unit is gas operated (natural gas or propane), the charge is computed as follows:

a. Compute the KWH consumption in same manner as shown in steps 1 through 4 above (Note: the calculations through step 4 produce 867.35 KWH per month).

b. Calculate the Coefficient of Performance (COP) adjustment in step 5 above for refrigerated air conditioning; that is, divide the number of KWH in paragraph 9a, above (867.35 KWH) by the COP (2); for example  $867.35 / 2 = 433.68$  KWH.

c. Convert the monthly KWH to MBTU's by dividing the KWH calculated in paragraph 9b, above by 234.4. Thus,  $433.68 \text{ KWH} / 234.4 \text{ (KWH per MBTU)} = 1.85 \text{ MBTU's}$ . [It takes 234.4 Kilowatts to generate 1 MBTU]

d. Calculate the volumes of natural gas and propane needed to produce 1.85 MBTU's. This is done as follows.

1) Natural Gas. For central air conditioning units that operate on natural gas, multiply the MBTU's calculated in paragraph 9c above by 1 MCF ( $1.85 \text{ MBTU's} \times 1 \text{ MCF} = 1.85 \text{ MCF}$ ). Thus, 1.85 MCF of natural gas would be required per month (annual average) to cool the dwelling in this example.

2) Propane. For central air conditioning units that operate on propane gas, multiply the MBTU's calculated in paragraph 9c above by 10.2 gallons ( $1.85 \text{ MBTU's} \times 10.2 \text{ gallons} = 18.87 \text{ gallons}$ ). Thus, 18.87 gallons of propane would be required per month (annual average) to cool the dwelling in this example.

e. Calculate the monthly charge for natural gas or propane consumed. This is done by multiplying the volume of fuel consumed by the unit cost of the fuel. These calculations are shown below.

Natural gas:  $1.85 \text{ MCF} \times \$5.83 \text{ per MCF} = \$10.79$  (rounded) per month.

Propane gas:  $18.87 \text{ gallons} \times \$1.03 \text{ per gallon} = \$19.44$  (rounded) per month.

TABLE 14a ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE I  
Single Family, One Story, Partial (Less Than 50%) or No Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	18	64	110	156	202	248	294	340	642	826	1010	1193	1377	1560	1744	1927
200	37	128	220	312	404	496	587	679	1285	1652	2019	2386	2753	3121	3488	3855
400	73	257	441	624	808	991	1175	1358	2570	3304	4038	4773	5507	6241	6975	7710
600	110	385	661	936	1212	1487	1762	2038	3855	4956	6058	7159	8260	9362	10463	11564
800	147	514	881	1248	1615	1982	2350	2717	5140	6608	8077	9545	11014	12482	13951	15419
1000	184	642	1101	1560	2019	2478	2937	3396	6425	8260	10096	11932	13767	15603	17438	19274
1200	220	771	1322	1872	2423	2974	3524	4075	7710	9912	12115	14318	16521	18723	20926	23129
1400	257	899	1542	2184	2827	3469	4112	4754	8995	11564	14134	16704	19274	21844	24414	26984
1600	294	1028	1762	2496	3231	3965	4699	5433	10280	13217	16154	19091	22028	24965	27902	30839
1800	330	1156	1982	2809	3635	4461	5287	6113	11564	14869	18173	21477	24781	28085	31389	34693
2000	367	1285	2203	3121	4038	4956	5874	6792	12849	16521	20192	23863	27534	31206	34877	38548
2200	404	1413	2423	3433	4442	5452	6461	7471	14134	18173	22211	26249	30288	34326	38365	42403
2400	441	1542	2643	3745	4846	5947	7049	8150	15419	19825	24230	28636	33041	37447	41852	46258
2600	477	1670	2864	4057	5250	6443	7636	8829	16704	21477	26249	31022	35795	40567	45340	50113
2800	514	1799	3084	4369	5654	6939	8224	9509	17989	23129	28269	33408	38548	43688	48828	53967
3000	551	1927	3304	4681	6058	7434	8811	10188	19274	24781	30288	35795	41302	46809	52315	57822

TABLE 14b ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE II  
Single Family, Single Story, Full Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	14	49	85	120	155	191	226	261	495	636	777	919	1060	1201	1342	1484
200	28	99	170	240	311	382	452	523	989	1272	1554	1837	2120	2402	2685	2968
400	57	198	339	480	622	763	904	1046	1978	2544	3109	3674	4239	4805	5370	5935
600	85	297	509	721	933	1145	1357	1569	2968	3815	4663	5511	6359	7207	8055	8903
800	113	396	678	961	1244	1526	1809	2091	3957	5087	6218	7348	8479	9609	10740	11870
1000	141	495	848	1201	1554	1908	2261	2614	4946	6359	7772	9185	10598	12012	13425	14838
1200	170	594	1017	1441	1865	2289	2713	3137	5935	7631	9327	11022	12718	14414	16110	17805
1400	198	692	1187	1682	2176	2671	3165	3660	6924	8903	10881	12859	14838	16816	18795	20773
1600	226	791	1357	1922	2487	3052	3618	4183	7914	10175	12436	14697	16958	19219	21480	23741
1800	254	890	1526	2162	2798	3434	4070	4706	8903	11446	13990	16534	19077	21621	24164	26708
2000	283	989	1696	2402	3109	3815	4522	5229	9892	12718	15544	18371	21197	24023	26849	29676
2200	311	1088	1865	2643	3420	4197	4974	5751	10881	13990	17099	20208	23317	26425	29534	32643
2400	339	1187	2035	2883	3731	4579	5426	6274	11870	15262	18653	22045	25436	28828	32219	35611
2600	367	1286	2204	3123	4042	4960	5879	6797	12859	16534	20208	23882	27556	31230	34904	38578
2800	396	1385	2374	3363	4352	5342	6331	7320	13849	17805	21762	25719	29676	33632	37589	41546
3000	424	1484	2544	3603	4663	5723	6783	7843	14838	19077	23317	27556	31795	36035	40274	44513

TABLE 14c ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE III

Single Family, Two Story, Partial (Less Than 50%) or No Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	16	56	96	136	176	215	255	295	558	718	878	1037	1197	1356	1516	1675
200	32	112	191	271	351	431	511	590	1117	1436	1755	2074	2393	2713	3032	3351
400	64	223	383	543	702	862	1021	1181	2234	2872	3510	4149	4787	5425	6064	6702
600	96	335	574	814	1053	1292	1532	1771	3351	4308	5266	6223	7180	8138	9095	10053
800	128	447	766	1085	1404	1723	2042	2362	4468	5744	7021	8297	9574	10851	12127	13404
1000	160	558	957	1356	1755	2154	2553	2952	5585	7180	8776	10372	11967	13563	15159	16754
1200	191	670	1149	1628	2106	2585	3064	3542	6702	8617	10531	12446	14361	16276	18191	20105
1400	223	782	1340	1899	2457	3016	3574	4133	7819	10053	12287	14521	16754	18988	21222	23456
1600	255	894	1532	2170	2808	3447	4085	4723	8936	11489	14042	16595	19148	21701	24254	26807
1800	287	1005	1723	2441	3159	3877	4596	5314	10053	12925	15797	18669	21541	24414	27286	30158
2000	319	1117	1915	2713	3510	4308	5106	5904	11170	14361	17552	20744	23935	27126	30318	33509
2200	351	1229	2106	2984	3862	4739	5617	6494	12287	15797	19308	22818	26328	29839	33349	36860
2400	383	1340	2298	3255	4213	5170	6127	7085	13404	17233	21063	24892	28722	32552	36381	40211
2600	415	1452	2489	3526	4564	5601	6638	7675	14521	18669	22818	26967	31115	35264	39413	43562
2800	447	1564	2681	3798	4915	6032	7149	8266	15638	20105	24573	29041	33509	37977	42445	46913
3000	479	1675	2872	4069	5266	6462	7659	8856	16754	21541	26328	31115	35902	40689	45476	50263

TABLE 14d ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE IV  
Single Family, Two Story, Full Basement

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	18	61	105	149	193	237	281	325	614	790	966	1141	1317	1492	1668	1843
200	35	123	211	298	386	474	562	650	1229	1580	1931	2282	2633	2985	3336	3687
400	70	246	421	597	772	948	1124	1299	2458	3160	3862	4565	5267	5969	6671	7374
600	105	369	632	895	1159	1422	1685	1949	3687	4740	5794	6847	7900	8954	10007	11061
800	140	492	843	1194	1545	1896	2247	2598	4916	6320	7725	9129	10534	11938	13343	14747
1000	176	614	1053	1492	1931	2370	2809	3248	6145	7900	9656	11412	13167	14923	16679	18434
1200	211	737	1264	1791	2317	2844	3371	3898	7374	9480	11587	13694	15801	17908	20014	22121
1400	246	860	1475	2089	2704	3318	3933	4547	8603	11061	13518	15976	18434	20892	23350	25808
1600	281	983	1685	2388	3090	3792	4494	5197	9832	12641	15450	18259	21068	23877	26686	29495
1800	316	1106	1896	2686	3476	4266	5056	5846	11061	14221	17381	20541	23701	26861	30021	33182
2000	351	1229	2107	2985	3862	4740	5618	6496	12289	15801	19312	22823	26335	29846	33357	36868
2200	386	1352	2317	3283	4249	5214	6180	7145	13518	17381	21243	25106	28968	32830	36693	40555
2400	421	1475	2528	3582	4635	5688	6742	7795	14747	18961	23174	27388	31602	35815	40029	44242
2600	456	1598	2739	3880	5021	6162	7303	8445	15976	20541	25106	29670	34235	38800	43364	47929
2800	492	1721	2949	4178	5407	6636	7865	9094	17205	22121	27037	31953	36868	41784	46700	51616
3000	527	1843	3160	4477	5794	7110	8427	9744	18434	23701	28968	34235	39502	44769	50036	55303

TABLE 14e ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE V

Apartments

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	11	40	69	98	126	155	184	212	402	517	632	747	861	976	1091	1206
200	23	80	138	195	253	310	368	425	804	1034	1263	1493	1723	1953	2182	2412
400	46	161	276	391	505	620	735	850	1608	2067	2527	2986	3446	3905	4364	4824
600	69	241	413	586	758	930	1103	1275	2412	3101	3790	4479	5168	5858	6547	7236
800	92	322	551	781	1011	1240	1470	1700	3216	4135	5054	5972	6891	7810	8729	9648
1000	115	402	689	976	1263	1551	1838	2125	4020	5168	6317	7466	8614	9763	10911	12060
1200	138	482	827	1172	1516	1861	2205	2550	4824	6202	7580	8959	10337	11715	13093	14472
1400	161	563	965	1367	1769	2171	2573	2975	5628	7236	8844	10452	12060	13668	15276	16884
1600	184	643	1103	1562	2021	2481	2940	3400	6432	8270	10107	11945	13783	15620	17458	19296
1800	207	724	1240	1757	2274	2791	3308	3825	7236	9303	11371	13438	15505	17573	19640	21708
2000	230	804	1378	1953	2527	3101	3675	4250	8040	10337	12634	14931	17228	19525	21822	24120
2200	253	884	1516	2148	2779	3411	4043	4675	8844	11371	13897	16424	18951	21478	24005	26531
2400	276	965	1654	2343	3032	3721	4410	5100	9648	12404	15161	17917	20674	23430	26187	28943
2600	299	1045	1792	2538	3285	4031	4778	5525	10452	13438	16424	19410	22397	25383	28369	31355
2800	322	1126	1930	2734	3538	4342	5146	5949	11256	14472	17688	20904	24120	27335	30551	33767
3000	345	1206	2067	2929	3790	4652	5513	6374	12060	15505	18951	22397	25842	29288	32734	36179

TABLE 14f ANNUAL KWH USAGE (ELECTRIC HEATING/COOLING) - TYPE VI

Mobile Homes

BASELINE CITY - SPRINGFIELD, ILLINOIS

Gross Square Feet	HEATING OR COOLING DEGREE DAYS															
	100	350	600	850	1100	1350	1600	1850	3500	4500	5500	6500	7500	8500	9500	10500
100	30	105	179	254	329	403	478	553	1046	1345	1644	1942	2241	2540	2839	3138
200	60	209	359	508	657	807	956	1106	2092	2689	3287	3885	4482	5080	5678	6275
400	120	418	717	1016	1315	1614	1912	2211	4184	5379	6574	7770	8965	10160	11355	12551
600	179	628	1076	1524	1972	2421	2869	3317	6275	8068	9861	11654	13447	15240	17033	18826
800	239	837	1434	2032	2630	3227	3825	4423	8367	10758	13148	15539	17930	20320	22711	25102
1000	299	1046	1793	2540	3287	4034	4781	5528	10459	13447	16436	19424	22412	25400	28389	31377
1200	359	1255	2152	3048	3945	4841	5737	6634	12551	16137	19723	23309	26895	30480	34066	37652
1400	418	1464	2510	3556	4602	5648	6694	7740	14643	18826	23010	27193	31377	35561	39744	43928
1600	478	1673	2869	4064	5259	6455	7650	8845	16734	21516	26297	31078	35859	40641	45422	50203
1800	538	1883	3227	4572	5917	7262	8606	9951	18826	24205	29584	34963	40342	45721	51100	56478
2000	598	2092	3586	5080	6574	8068	9562	11057	20918	26895	32871	38848	44824	50801	56777	62754
2200	657	2301	3945	5588	7232	8875	10519	12162	23010	29584	36158	42732	49307	55881	62455	69029
2400	717	2510	4303	6096	7889	9682	11475	13268	25102	32273	39445	46617	53789	60961	68133	75305
2600	777	2719	4662	6604	8546	10489	12431	14374	27193	34963	42732	50502	58271	66041	73811	81580
2800	837	2929	5020	7112	9204	11296	13387	15479	29285	37652	46020	54387	62754	71121	79488	87855
3000	896	3138	5379	7620	9861	12103	14344	16585	31377	40342	49307	58271	67236	76201	85166	94131

TABLE 15 MPS COOLING ZONE CONVERSION FACTORS

	Dwelling Prototypes					
	I	II	III	IV	V	VI
HUD MPS Heating <u>Zone</u>	Single Story No <u>Basement</u>	Single Story Full <u>Basement</u>	Double Story No <u>Basement</u>	Double Story Full <u>Basement</u>	Apart- ments	Mobile Homes
1						
2						
3						
4	1.94	2.21	2.12	1.96	2.52	2.15
5	2.24	2.60	2.47	2.28	3.01	2.49
6	2.24	2.60	2.47	2.28	3.01	2.49
7	2.61	3.08	2.89	2.67	3.60	2.89
8	1.29	1.37	1.38	1.29	1.49	1.45

## F. NON-SPACE HEATING/COOLING ENERGY CONSUMPTION/COST

The examples in the preceding sections (VI.C, VI.D and VI.E) dealt with the charges for space heating and cooling. However, to compute **total** energy consumption charges, the costs for energy consumed by lights, equipment, and appliances (Government **and** tenant owned) must be determined and added to the heating and cooling charges.

1. **Consumption.** Electric non-space heating/cooling consumption and cost estimates include electricity used by small appliances, lights, radios, television, refrigerators, ranges, washers, dryers, etc. These items, and their associated consumption levels, are shown in Table 16.

To use Table 16, first, determine the finished floor space square footage range within which a specific quarters unit falls. Then, using the values in Table 16, add the KWH consumed by each appliance or equipment item which is present in the quarters unit. If a housing unit has more than one (1) refrigerator, freezer, room (window) air conditioner, or space heater, multiply the KWH shown in the table times the number of refrigerators, freezers, room air conditioners, or space heaters that are present in the quarters unit to determine the total monthly KWH consumption for these appliances.

There may be instances where appliances are fueled by fossil fuels rather than by electricity. Table 16a provides monthly consumption (in MCF or gallons of fuel) for the most common of these.

If an appliance listed in Table 16 or Table 16a is not present in the quarters unit at issue, do not include its monthly energy consumption when computing the total energy consumed by equipment and appliances.

2. **Cost.** The cost of electricity or fossil fuel consumed by appliances and equipment is easily computed by multiplying the total monthly consumption (as determined in the preceding paragraphs) times the appropriate charge per KWH, MCF or gallon. These unit charges are shown in Table 17.

TABLE 16

## MONTHLY KWH USAGE: APPLIANCES AND EQUIPMENT

Appliance/ Equipment	Gross Square Feet of Living Space									
	Under 301	301- 500	501- 700	701- 1,100	1,101- 1,300	1,301- 1,500	1,501- 1,900	1,901- 2,100	2,101- 2,500	Over 2,500
Hot water heater	130	130	245	245	370	370	480	480	600	705
Stove / Microwave	45	45	50	50	55	55	60	60	65	70
Refrigerator 1/	45	50	50	50	85	85	85	85	85	85
Clothes washer	20	35	35	35	45	45	45	55	55	65
Clothes dryer	15	15	25	25	35	35	35	35	40	50
Dishwasher	35	35	45	45	60	60	70	70	80	95
Freezer 1/	70	70	70	70	70	70	70	70	70	70
Furnace fan	15	15	20	20	20	25	25	30	30	35
Room air conditioner	65	65	65	65	65	65	65	65	65	65
Television / radio	5	5	10	10	20	20	20	20	25	25
Lights	50	55	75	80	90	90	95	100	120	120
Space heater (portable) 1/	130	130	130	130	130	130	130	130	130	130
Misc. small appliances	30	30	45	45	65	65	75	80	95	105
Engine Heaters	195	195	195	195	195	195	195	195	195	195
Hot Tub	360	360	360	360	360	360	360	360	360	360

1/ If more than one of these appliances are present in a quarters unit, multiply the KWH consumption times the number of appliances to determine the total KWH consumed for each appliance category.

NOTE: FOR APPLIANCES OPERATED BY FOSSIL FUELS, SEE TABLE 16a.

TABLE 16a MONTHLY FOSSIL FUEL CONSUMPTION: APPLIANCES AND EQUIPMENT

Appliance/ Equipment	Gross Square Feet of Living Space									
	Under 301	301- 500	501- 700	701- 1,100	1,101- 1,300	1,301- 1,500	1,501- 1,900	1,901- 2,100	2,101- 2,500	Over 2,500
Hot water heater										
Natural gas MCF	.55	.55	1.05	1.05	1.58	1.58	2.05	2.05	2.56	3.01
Propane Gallons	5.61	5.61	10.71	10.71	16.12	16.12	20.91	20.91	26.11	30.70
Fuel oil Gallons	3.87	3.87	7.39	7.39	11.12	11.12	14.43	14.43	18.02	21.19
Kitchen Range										
Natural Gas MCF	.19	.21	.21	.21	.36	.36	.36	.36	.36	.36
Propane Gallons	1.94	4.94	2.14	2.14	2.35	2.35	2.65	2.65	2.86	3.06
Fuel oil Gallons	1.34	1.34	1.48	1.49	1.62	1.62	1.83	1.83	1.97	2.11
Refrigerator 1/										
Natural Gas MCF	.19	.21	.21	.21	.36	.36	.36	.36	.36	.36
Propane Gallons	1.94	2.14	2.14	2.14	3.67	3.67	3.67	3.67	3.67	3.67
Clothes dryer										
Natural Gas MCF	.06	.06	.11	.11	.15	.15	.15	.15	.17	.21
Propane Gallons	.61	.61	1.12	1.12	1.53	1.53	1.53	1.53	1.73	2.14
Freezer 1/										
Natural Gas MCF	.30	.30	.30	.30	.30	.30	.30	.30	.30	.30
Propane Gallons	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06	3.06
Space heater (portable) 1/										
Natural Gas MCF	.55	.55	.55	.55	.55	.55	.55	.55	.55	.55
Propane Gallons	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61	5.61
Fuel oil Gallons	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87

1/ If more than one of these appliances are present in a quarters unit, multiply the consumption times the number of appliances to determine the total consumed for each appliance category.

**NOTE:** To compute the cost per month for an appliance that is fueled by a fossil fuel, multiply the consumption listed by the unit cost found in Table 17 of this report.

## G. WATER AND SEWER CONSUMPTION/COST CALCULATIONS

In accordance with OMB Circular No. A-45 and Departmental policies and guidelines, when utilities are furnished by the Government, charges shall be based upon regional average residential rates and consumption levels applicable to private rental housing in the survey region.

Where regional survey procedures are used to establish base rental rates, *the charges for Government-furnished water and sewer services, must be based upon regional average water and sewer rates, and not the rates prevailing in the nearest Established Community.* In determining the regional average rates, the water and sewer rates for each survey community were obtained and averaged.

Thus, where the water service is unmetered, and where the Government furnishes water and sewer services, *including well water and septic waste disposal systems*, the regional average flat rate charges, shown below, shall be used. These charges are based upon (1) the average of the monthly service costs (including taxes, service charges, etc.) in all surveyed communities; and (2) consumption levels (based on numbers of bedrooms) contained in planning guides published by the Department of Housing and Urban Development (HUD). The rates below are based upon the number of bedrooms contained in a dwelling.

### Flat Rate Water and Sewer Charges

<u>Number of Bedrooms</u>	<u>Monthly Charges</u>	<u>Total</u>
1 (or less)	\$12.00 water + \$14.10 sewer	= \$26.10
2	\$16.00 water + \$19.00 sewer	= \$35.00
3	\$21.00 water + \$25.50 sewer	= \$46.50
4	\$26.00 water + \$33.00 sewer	= \$59.00

## H. GOVERNMENT PROVIDED METERED UTILITIES

Where the Government provides the utilities, and the consumption is metered *at the quarters unit level*, the following unit charges will apply.

TABLE 17 UTILITY CHARGES (COST PER UNIT)

**Do not calculate the total cost of electricity in steps, such as the first 500 KWH costs so much, then the second 500 KWH costs so much, etc.**

a. <u>Electricity</u>	KWH Consumed <u>Per Month</u>	<u>Charge Per KWH</u>
	0 - 500	\$.084
	501 - 1,000	\$.078
	1,001 - 1,500	\$.076
	Over - 1,500	\$.075
b. <u>Fuel Oil #2</u>	\$1.19 per gallon.	
c. <u>Propane</u>	\$1.03 per gallon.	
d. <u>Natural Gas</u>	\$5.83 per MCF (1,000 cubic feet).	
e. <u>Water</u>	<u>Water Consumed per Month</u>	<u>Cost Per Gallon</u>
	1 - 3,000 gallons	\$0.0040
	3,001 - 5,000 gallons	\$0.0032
	5,001 - 7,500 gallons	\$0.0028
	Over - 7,500 gallons	\$0.0026
f. <u>Sewer</u>	<u>Sewer Consumed Per Month</u>	<u>Cost Per Gallon</u>
	1 - 3,000 gallons	\$0.0047
	3,001 - 5,000 gallons	\$0.0038
	5,001 - 7,500 gallons	\$0.0034
	Over - 7,500 gallons	\$0.0033

## I. GARBAGE/TRASH REMOVAL SERVICE RATES

In the case of garbage and trash hauling, as with other Government-provided services, OMB Circular No. A-45 requires the charges to be based upon the domestic rates for comparable services provided to occupants of private rental units in the survey area.

The garbage and trash services provided to quarters occupants vary from weekly to daily service. Establishment of a service charge based upon the service in the nearest established community may or may not reflect a similar level of service. Therefore, the charge for garbage and trash collection, when conducted by the Government, will, regardless of quarters type, be **\$10.25 per quarters unit per month**.

## J. CHARGES FOR APPLIANCES AND RELATED SERVICES

OMB Circular No. A-45 requires agencies to charge occupants of Government quarters for appliances, furnishings and services which the Government provides with the quarters. The charges for appliances, furnishings and services most typically provided by Federal agencies are found in Table 18. The monthly recapture cost of the items in Table 18 were determined from information gathered by contractors in the survey communities of all QMIS regions, and from special studies conducted by the QMIS Program Office.

Agencies providing appliances, furnishings or services that are not included in Table 18 are responsible for establishing an appropriate monthly charge which reflects the private market value of the item(s) provided. In such cases, the agency or bureau should advise the QMIS Program Office to ensure that subsequent regional survey reports include charges for all Government-provided appliances, furnishings and services.

TABLE 18 MONTHLY CHARGES FOR APPLIANCES & RELATED SERVICES

APPLIANCES		SERVICES AND FURNISHINGS	
Range (Gas / Electric) *	(+/-) \$3.65	Storage Shed (Per Unit)	\$2.60
Refrigerator *	(+/-) \$3.35	Furniture (Per Room)	11.80
Clothes Washer	3.85	Swimming Pool	
Clothes Dryer	3.25	Private Pool	60.00
Dishwasher	3.20	Community Pool	20.00
Microwave Oven	1.50	Satellite Dish	16.10
Trash Compactor	3.65	Cable Television	20.90
Freezer	1.95	Premium Channel (Each)	14.05
Freezer (Community)	1.00	Maid Service	62.70
Window Air Conditioner		Lawncare (Per Mowing)	
Refrigerated Unit	4.15	Houses (Excluding Plexes)	18.20
Evaporative (Swamp) Unit	3.10	All Other Classes	9.10
Free Standing Stove	3.70	Snow Removal (Per Removal)	11.35
Fireplace Insert	4.45	Firewood (Per Cord)	117.30
Lawn Mower	3.90		
Hot Tub	33.60	<u>ELECTRIC CREDITS</u>	
		Well pump (0-1 Bedroom)	1.00
		Well pump (2 Bedrooms)	1.60
		Well pump (3 Bedrooms)	2.35
		Well pump (4+ Bedrooms)	3.15
Community Laundry (Non-Coin Operated)			
Washer Only	1.95		
Dryer Only	1.60		
Washer and Dryer	3.55	Sewer Lift Pump (0-1 Bedroom)	1.00
		Sewer Lift Pump (2 Bedrooms)	1.00
		Sewer Lift Pump (3 Bedrooms)	1.20
		Sewer Lift Pump (4+ Bedrooms)	1.60
ISOLATION ADJUSTMENT FACTOR	2.48	Base Radio	1.00
		Remote Control Relay	1.00
		Sump Pump	1.00
		Radon Mitigation Fan	9.30

\* If the Government provides one range and refrigerator, no additions or deductions are made.

If the Government does not provide a range or a refrigerator, deduct the amount shown above.

If the Government provides 2 or more ranges or refrigerators, add the amounts shown above for each appliance furnished in excess of one range and one refrigerator.

## VII. ADMINISTRATIVE ADJUSTMENTS.

Once the MBRR is established, certain adjustments (e.g. for isolation and amenity deficiencies) are authorized by OMB Circular No. A-45. These administrative adjustments are established by OMB and are not derived from regional surveys conducted by the QMIS Program Office.

The administrative adjustments contained in OMB Circular A-45, and described below, are not authorized for dormitories, bunk houses, or transient quarters. This is because the rental rates for those housing classes are administratively established, through extensions of the principle of comparability, and are not based directly upon market comparability.

### A. SITE AMENITY ADJUSTMENTS

Living conditions at some Government housing sites are not always the same as those found in the survey communities. In the communities surveyed, the amenities discussed below (and in OMB Circular A-45) are generally present and their contributory value is included in the contract rent and in the quarters MBRR's determined from the tables in this report. Thus, if any amenity listed below is present at the quarters site, no positive adjustment is made for that amenity because its presence has already accounted for in the MBRR. However, the lack of an amenity discussed below represents a less desirable condition that should be reflected as a **negative** percentage adjustment to the quarters MBRR or CPI-adjusted MBRR (CPI-MBRR), whichever is applicable.

1. **Reliability and adequacy of water supply.** The water delivery system at the quarters site should provide potable water (free of significant discoloration or odor) at adequate pressure at usual outlets. If the water delivery system at the quarters site does not meet these conditions, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

2. **Reliability and adequacy of electric service.** Electric service at the quarters site must equal or exceed a 100-ampere power system, and should provide 24-hour service under **normal** conditions. When evaluating the electric service, housing managers are reminded that OMB Circular A-45 recognizes that occasional temporary power outages are considered to be "**normal**" conditions. Furthermore, if an adequate back-up generator is available, then the electric service amenity will be considered to be reliable and adequate regardless of the reliability of the primary power source. When electric service is inadequate and unreliable, 3 percent should be deducted from the MBRR or CPI-MBRR whichever is applicable.

3. **Reliability and adequacy of fuel for heating, cooling and cooking.** There should be sufficient fuel storage capacity to meet prevailing weather conditions and needs. Where electricity is used as the heating, cooling or cooking "fuel," an adjustment can only be made when a deduction has been made for deficient electric service (see paragraph VII.A.2, above). If the fuel delivery/storage system is inadequate, 3 percent should be deducted from the MBRR or the CPI-MBRR, whichever is applicable.

4. **Reliability and adequacy of police protection.** Law enforcement personnel, including Government employees with law enforcement authority, should be available on a 24-hour basis. OMB Circular A-45 defines "**availability**" as the ability of law enforcement officers to respond to emergencies at the quarters site as quickly as a law enforcement officer in the nearest established community could respond to an emergency in the nearest established community.

OMB Circular A-45 further provides that where part-time officers serve the quarters site, the fact that the officers are part-time does not necessarily mean that they are less available than officers in the nearest established community. The important point is that the availability determination must be based on comparative response times (quarters site vs. the nearest established community) - not the employment conditions of the officers serving the quarters site.

Finally, OMB Circular A-45 provides that gaps in availability due to temporary illness or injury, use of annual leave, temporary duties, training, or other short absences, do not render law enforcement personnel "unavailable" at the quarters site.

If, after applying these guidelines, it is determined that the law enforcement protection at the quarters site is unreliable and inadequate in comparison to the reliability and adequacy of law enforcement protection in the nearest established community, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

**5. Fire insurance availability or reliability and adequacy of fire protection.** Fire insurance should be available (for the quarters) with the premium charge based upon a rating equal to the rating available to comparable housing located in the nearest established community. Alternatively, adequate equipment, an adequate supply of water (or fire retardant chemical), and trained personnel should be available on a 24-hour basis to meet foreseeable emergencies. OMB Circular A-45 provides that **if either element is present (adequate insurance or an adequate fire fighting capability), no adjustment is authorized.** If both elements are missing, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

**6. Reliability and adequacy of sanitation service.** An adequately functioning sewage disposal system and a solid waste disposal system should be available. OMB Circular A-45 considers septic, cesspool or other systems adequate even though they may require periodic maintenance, as long as they are usable during periods of occupancy. If the sanitation service at the quarters site is unreliable or inadequate, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

**7. Reliability and adequacy of telephone service.** Access to commercial telephone facilities should be available on a 24-hour basis. Deductions (except as provided below) are not allowed for occasional temporary interruptions of telephone service. OMB Circular A-45 allows specific deductions for various levels of service and privacy. These are explained below.

a. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 3 percent if telephone service is not available within the quarters or within 100 yards of the quarters.

b. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 2 percent if there is no telephone service within the quarters, but telephone service (either private or party line) is available within 100 yards of the quarters.

c. The MBRR or CPI-MBRR (whichever is applicable) should be reduced by 1 percent if telephone service is available in the employee's quarters, but the service is not private line service and/or the service is not accessible on a 24-hour per day basis.

8. **Noise and odors.** If there are frequent disturbing or offensive noises and/or odors at the quarters site, 3 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

9. **Miscellaneous improvements.** One or more of the following improvements should be available at the quarters site: paved roads/streets, sidewalks or street lights. If any one of these improvements is present, no deduction is authorized. If all three of these improvements are missing (i.e., there are no paved roads/streets **and** there are no sidewalks, **and** there are no street lights), 1 percent should be deducted from the MBRR or CPI-MBRR, whichever is applicable.

## B. ISOLATION ADJUSTMENT

In some cases, Government quarters are located far from the nearest established community (see paragraph IX.C for the OMB's definition of "established community"). In addition, different modes of transportation (travel categories) may serve to further isolate the quarters from the nearest established community. In situations where the quarters location and the travel categories meet the requirements contained in OMB Circular A-45, an isolation adjustment should be applied. To determine whether an isolation adjustment applies, and the amount of the adjustment (if one does apply), you should follow the steps in the Isolation Adjustment Computation Schedule, shown on the following page. This schedule is a (modified) reproduction of the appendix to OMB Circular A-45, and is included in this report for illustrative purposes, only. Therefore, you should use the form prescribed by your agency or bureau when documenting the isolation adjustment.

## Isolation Adjustment Computation

- *Step 1.* Determine the one-way distance in miles (from the quarters to the nearest established community) for each category of transportation listed in Figure 1. Enter mileage(s) in the appropriated block(s) under Column B.
- *Step 2.* Multiply mileage figures entered in Column B by point values listed in Column A for each affected category of transportation to produce one-way points for each category. Add 29 points to the category 4 subtotal and 27 points to the category 5 subtotal to reflect relative differences in cost or time by use of these modes of travel.
- *Step 3.* Add all categories of one-way points in Column C to produce one-way points. (The total must exceed 30 points or there is no adjustment for isolation.)

Figure 1

<u>Category of Travel</u>	<u>Column A Point Value</u>		<u>Column B One-way Miles</u>		<u>Column C One-way Points</u>
(1) Paved road or rail	1.0	X	___	=	___
(2) Unpaved but improved road	1.5	X	___	=	___
(3) Unimproved road	2.0	X	___	=	___
(4) Water, snowmobile, pack animal, foot or other special purpose conveyance	2.5	X	___	= ___+29	___
(5) Air	4.0	X	___	= ___+27	___
				=	___
TOTAL ONE-WAY POINTS					

- *Step 4.* Calculate the Isolation Adjustment Factor (IAF) using the following OMB formula: Multiply 2 (to reflect round-trip points) by 4 (to reflect number of trips per month) and then multiply by \$x.xx (GSA's current automobile allowance as of the last day of September of each year). For example, the GSA mileage allowance, as of September 30, 1999, was \$0.31 per mile, resulting in a IAF of 2.48.

ISOLATION ADJUSTMENT FACTOR = 2.48

- *Step 5.* Multiply total adjusted points by the Isolation Adjustment Factor to produce the monthly adjustment for isolation (rounded to the nearest whole dollar).

MONTHLY ADJUSTMENT = \_\_\_

### C. LOSS OF PRIVACY

Some quarters occupants are subject to a loss of privacy during non-duty hours by virtue of **public visits which occur several times daily**. In other cases, quarters occupants may be **inhibited from enjoying the full range of activities normally associated with living in private rental housing** (such as where restrictions are imposed on activities in quarters at national cemeteries, or where quarters are in view of prison inmates). In such cases, OMB Circular A-45 allows a deduction from the MBRR or CPI-MBRR (whichever is applicable) of up to 10 percent. OMB Circular A-45 instructs housing managers to establish proportional adjustments to reflect situations of less frequency or seriousness in their impact upon privacy or usage, or to reflect seasonal variations.

### D. EXCESSIVE OR INADEQUATE SIZE

Quarters occupants are sometimes provided dwellings that are excessively large or small for their needs. This may be because the range and variety of quarters available at an installation may be much less than that which is available in private rental markets. In such cases, OMB Circular A-45 allows a deduction from the MBRR or the CPI-MBRR (whichever is applicable) of up to 10 percent. The Circular instructs that the deduction should be in direct proportion to the degree of excess or inadequacy, and that the deduction must not continue beyond one month after suitable quarters are made available. Before this adjustment is applied, local housing managers should consult with managers within their agencies or bureaus to determine whether other alternatives (such as closing off rooms and other excess space) would offer a more suitable means of adjustment.

### E. LIMITATIONS TO ADMINISTRATIVE ADJUSTMENTS

Administrative adjustments cannot be applied without limit. OMB Circular A-45 provides that the MBRR or CPI-MBRR cannot be reduced by more than 50 percent unless an isolation is authorized and applied. For quarters which receive an isolation adjustment, the MBRR or CPI-MBRR may not be reduced by more than 60 percent. These limitations do not apply to excessive heating or cooling adjustments, which are described in paragraph IX.A of this report.

## VIII. CONSUMER PRICE INDEX ADJUSTMENTS

OMB Circular A-45 requires annual verification, and adjustment (when necessary) of the following rental components that are presented in this report: (1) the Monthly Base Rental Rates (MBRR's); (2) the charges for related facilities (utilities, appliances, furnishings and services); and (3) the Isolation Adjustment Factor (IAF). These verifications and adjustments are to be made, essentially, in each interim year between baseline regional surveys.

Generally, OMB Circular A-45 specifies that these changes are to be based upon September index levels of specified components of the Consumer Price Index (CPI); and the GSA temporary duty mileage allowance in effect as of September 30, of each year. These changes must be implemented at the beginning of the first pay period in March of each following year.

The QMIS Program Office is responsible for determining the amounts of these changes, and for providing QMIS Program participants with the information, the software and the instructions needed to implement the required changes. This information is usually distributed to each National Quarters Officer in November of each year. National, regional or installation quarters managers (as required by your agency or bureau) are responsible for implementing these annual rental adjustments.

## IX. OTHER OMB CIRCULAR A-45 RENT CONSIDERATIONS

### A. EXCESSIVE HEATING OR COOLING COSTS

OMB Circular A-45 authorizes a deduction from the Monthly Base Rental Rate (MBRR) or the Consumer Price Index - adjusted Monthly Base Rental Rate (CPI-MBRR), whichever is applicable, when quarters are unusually costly to heat or cool. This adjustment is allowed only when (1) the excessive heating or cooling costs are due to the poor design of the quarters or the lack of adequate insulation/weather-proofing; and (2) when the energy/fuel used for heating and/or cooling is metered. This adjustment will vary from quarters-to-quarters, but is the difference between the actual heating and/or cooling costs paid by the quarters occupant and 125 percent of the cost of heating and/or cooling a comparable (but adequately constructed and insulated) dwelling located in the same climate zone. For more information on this adjustment, you should consult your agency or bureau policies.

### B. INCREMENTAL ADJUSTMENTS

New baseline regional surveys or annual CPI adjustments may occasionally increase quarters rents by more than 25 percent. When this occurs, OMB Circular A-45 allows housing managers to impose the increase incrementally over a period of not more than one year. The Circular also requires that such increases must be applied in equal increments on at least a quarterly basis.

### C. ESTABLISHED COMMUNITY

OMB Circular A-45 has established the following minimum standards for use in determining which population centers (cities, towns, etc.) may be used as "established communities" when determining quarters rents.

1. An established community must have a year-round population of 1,500 or more (5,000 or more in Alaska). The population determinations must be based upon the most recently conducted decennial census.
2. An established community must have at least one doctor and one dentist, who are available to all quarters occupants on a non-emergency basis.
3. An established community must have a private rental market with housing available to the general public. This requirement excludes communities on military posts, Indian reservations and other Government installations which may meet the other criteria contained in paragraphs IX.C.1 and 2, above.